

COMPUTERWORLD

Switched management help en route

By Stephen P. Klett Jr.
DURHAM, N.H.

Cabletron Systems, Inc. last week said it expects to be the first internetworking vendor to provide end-to-end management in switched LAN and ATM environments.

That will happen when it ships its Automated Connection Management Services in the third quarter of next year.

ACMS will be able to manage switched networks of 500,000-plus nodes, according to Cabletron.

The emergence of LAN and Asynchronous Transfer Mode switching is driving a transition from bridged/routed networks to switched internetworks.

While switches offer users higher bandwidth and data rates, the software to manage them is missing in action.

Industry lagging

"The industry is immature in its ability to manage a [switched] type of environment," said Blair Sanders, a senior member of the technical staff at Texas Instruments, Inc. in Plano.

Currently in alpha testing at Cabletron's Network Management division here, the nonproprietary ACMS will provide automated connection management between individual nodes. It will allow users to set up virtual LANs across multiple switches from multiple vendors.

Cabletron, page 139

Cairo falters again

Microsoft mulls interim Windows NT 3.5 version with 'Indy' interface

By Stuart J. Johnston and Ed Scannell
LAS VEGAS

Microsoft Corp. executives last week acknowledged that delivery of Cairo, the next major release of Windows NT, will slip again, this time into 1996. They also indicated that an interim version of NT 3.5 with the Windows 95 look and feel — a graphical user interface called Indy — is under consideration.

Microsoft officials said the idea of an interim version of NT 3.5 may never see the light of day, although they admitted that the company already has a prototype of Indy running in-house.

"We're looking at that and how easy that would be to do. It'd be nice if the [Windows 95]

The race to Indy

User reaction to putting the Indy interface onto Windows NT 3.5 runs the gamut:

PRO Cuts user training costs

Cuts corporate development costs

CON Adds the burden of another upgrade

shell was there [on Windows NT 3.5]," said Bill Gates, Microsoft chairman and chief executive officer. "We're seeing if there's an effective way we can get that out before Cairo, but we're not in a position to make a commitment on that."

Separately, Mike Maples, Microsoft's executive vice president of products, acknowledged that the schedule for Cairo has slipped, this time to "sometime in 1996."

Cairo will feature the Windows 95 user interface and an object-oriented file system. It was initially scheduled to ship in the first half of 1995, then postponed to the second half.

A version of NT with Indy may not be a done deal, but eager users generally hailed the con-

Cairo, page 139

High-tech execs, IS shops cheer GOP takeover, plans

By Gary H. Anthes
WASHINGTON

The stunning Republican takeover of Congress will mean a greater emphasis on deficit reduction, free trade and deregulation — just the kind of policies the high-tech business community likes to see.

Yet the free-marketeers are also likely to gut the very Clinton administration initiatives that are pumping millions of dollars into

the research and development of advanced computing and communications technologies.

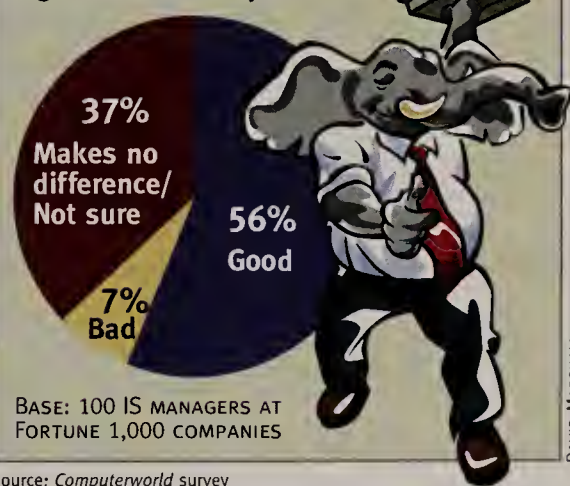
As for corporate information systems managers, *Computerworld* found in a survey of 100 IS managers last week that they like the Grand Old Party just fine (see chart at right).

"The Republican Party will continue to aggressively push forward technology issues in government," said Eric Singleton, director of IS

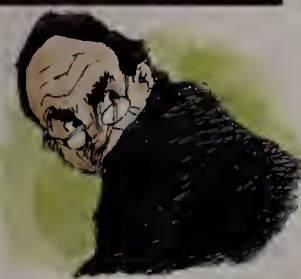
GOP, page 12

Trumpeting victory

Do you think the resurgence of the Republican Party is likely to be good or bad for the high-tech community?



Backstabbing and betrayal can quickly dominate IS teams.



Family Feud

Managers must learn to mediate this war of raw nerves and revenge.

See Management, page 85.

Newspaper

Alliance raises hopes, red flags

Sybase/Powersoft union sparks worries about product futures

By Kim S. Nash
and Rosemary Cafasso

Sybase, Inc.'s \$904 million acquisition of Powersoft Corp. raised as many hopes as worries among users last week.

While joint customers said they hoped the partnership would deliver a broad scale of integrated tools and database products, other users said they doubted Powersoft's flagship product, PowerBuilder, would remain database-neutral once Sybase takes over.



Sybase CEO and President Mark Hoffman: *The companies have worked in joint development for four years and share a vision 'to interoperate with other software'*

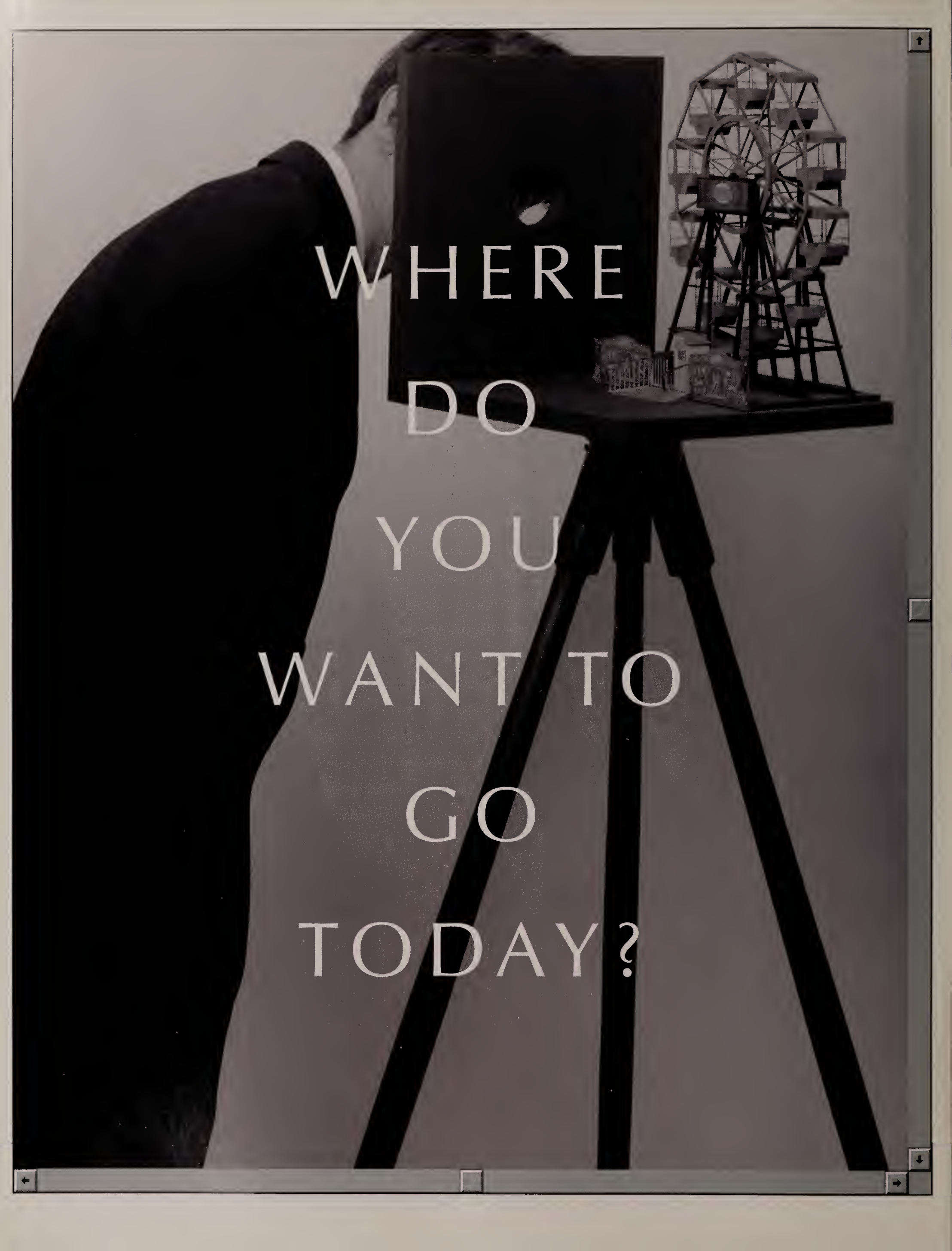
And the deal, which is expected to be approved by government officials and shareholders by March, effectively spells doom for Build Momentum, Sybase's troubled stab at creating a graphical development tool, users and analysts said.

A tough challenge will be to maintain the Powersoft magic.

"Powersoft had tremendous presence and excitement around it," noted Brent Williams, an analyst at Gartner Group, Inc. "But now it's gone from being an upstart that challenged Microsoft to a minority revenue-maker in a large, boring database company."

Alliance, page 15

Powersoft will be the fourth development tools company Sybase has acquired since 1991. The others are Deft Software, Inc. in 1991, Gain Technology, Inc. in 1992 and Wyvern Technologies, Inc. in 1993.

A black and white photograph of a man in a dark suit and white shirt, seen from the side, looking intently at a model of a city. The model, which includes a prominent Ferris wheel and several buildings, sits on a dark, three-legged tripod. The man's face is partially obscured by a dark rectangular shape. The background is a plain, light-colored wall. The overall mood is one of professional interest and contemplation.

WHERE
DO
YOU
WANT TO
GO
TODAY?

ON-LINE INFO

TECHNICAL TROUBLESHOOTING

Systems operators from Gupta and Powersoft reveal the secrets to getting your system problems addressed on CompuServe.
See In Depth, page 109.



JOB SEARCHING

On-line resources put you in touch with job opportunities that conventional methods don't provide.
See Computer Careers, pages 115 and 117.

NEWS

■ Novell will offer multiprotocol routing capabilities over a wide-area network with its NetWare 4.1 release, due out next month. *Page 4*

■ Microsoft's Windows NT server software is beginning to nibble away at the Unix workstation and server markets. *Page 2*

■ A design change in the PowerPC 603 chip has pushed back the availability of Apple's PowerPC-based notebooks until mid-1995. *Page 6*

■ IBM is starting to deliver clustering technology for the AS/400, but full support for clusters will take two to three years. *Page 10*

■ AT&T and Lotus launch a handful of market trials for AT&T Network Notes, a wide-area communications network. *Page 14*

■ IBM announces its well-publicized Workgroup product line at Comdex. Other vendors try to show that they are on track to deliver applications for Windows 95 next year. *Pages 14 and 16*

■ Software tools vendor Gupta Corp. is in the throes of a costly midlife crisis. *Page 20*

■ Oracle has delayed systems management tools integrated with Hewlett-Packard's OpenView system until mid-1995. *Page 24*

■ The numbers of Internet access vendors and their offerings are booming, but watch for the inevitable shakeout. *Page 28*

■ The once-beleaguered Sequoia turned down Digital but has signed deals with others to expand its business. *Page 28*

■ Start-up Wildfire has a big vision — and two dogs to help steady the ship. *Page 30*

DESKTOP COMPUTING

■ Add-on applications bring definition to increasingly generic application suites. *Page 39*

■ Vendors are building digital signal processing capabilities into CPU chips in the hopes of reducing costs of multimedia systems. *Page 39*

WORKGROUP COMPUTING

■ Competitors in the Windows NT backup market are waging war, as

shown by their Comdex introductions. *Page 49*

ENTERPRISE NETWORKING

■ Network and systems management vendors make lofty scalability promises, but users wonder why. *Page 57*

LARGE SYSTEMS

■ Let the user beware: The major database players approach replication differently and to varying degrees. *Page 65*

APPLICATION DEVELOPMENT

■ Users see relief within reach as the Object Management Group closes in on an interoperability standard. *Page 73*

MANAGEMENT

■ Backstabbing and betrayal can quickly dominate IS teams. Managers must learn to mediate this war of raw nerves and revenge. *Page 85*

MARKETPLACE

■ Don't simply accept pass-through warranties from systems integrators, one legal expert says. Ask for more integrated coverage. *Page 125*

COMMENTARY

■ Charles Babcock looks forward to a time when relational really relates. *Page 6*

■ Bill Laberis says the government shouldn't make striving to be the best anything less than what it is: good for customers. *Page 34*

■ Michael Cohn says the date field challenge of the Year 2000 is nothing compared with the challenges IS has already dealt with. *Page 35*

■ Esther Dyson hopes the national information infrastructure is allowed to mature in a natural way. *Page 35*

■ Stan Schatt says Bill Gates may have missed some crucial first-grade lessons. *Page 49*

Calendar.....Page 94

Company Index Page 136

Editorial/Letters to the editor Page 34

Nov. 18 Stock Ticker.....Page 137

How to contact Computerworld ...Page 140

Executive Briefing

Sybase's purchase of Powersoft raises both hopes and worries for users. Joint customers hope the partnership will deliver more integrated tools and database products, but other users doubt Powersoft's flagship, PowerBuilder, will remain database-neutral once Sybase takes over. The combined company may find that potential customers have already turned to other client/server vendors to get capabilities such as partitioning. *Cover 1*

Emphasis on deficit reduction, free trade and deregulation is the expected fallout from the Republican takeover of Congress, and that should please the high-tech business community. Yet the free-market-eers are also likely to gut the very Clinton administration initiatives that are pumping millions of dollars into the research and development of advanced technologies. *Computerworld* found that managers like the Grand Old Party. Out of 100 IS managers surveyed, 56% said the Republican takeover would be good for the high-tech community. *Cover 1*

The music stopped and IS executives scrambled to find a chair last week. High-ranking IS executives either joined or left a batch of companies, including Procter & Gamble, Xerox, Microsoft and Bell Atlantic. And the game of musical chairs has only just begun, according to recruiters and consultants, who predict more high-profile job-hopping among companies by top IS talent. *Page 8*. There is also a new breed of corporate chieftain, typified by Daniel G. Hoffman. He represents the new IS executives who are passionate about the impact that technology has made on their companies. *Page 8*

On site this week: Marin County sets up a countywide Internet system to connect local government, county and private organizations with any-to-any data links. *Page 57*. KPMG's groupware system helps the huge consulting and accounting firm work faster, but it doesn't use Notes. *Page 58*. Teleport Communications makes client/server work one decision at a time. *Page 68*. PNC Bank is using parallel processing to help it handle its expanding loan portfolio. *Page 65*

The 5th Wave by Rich Tennant





It's a question for every kid in third grade and every CEO of a Fortune 500 corporation.

It's a question that has as many correct answers as there are people on the planet.

It's a question that defines all of our roles in the computer business and all the technology businesses to come.

It's a question about vision, about learning, about imagination.

And, starting now, it's a question we'll be asking the world every day.

WHERE DO YOU WANT TO GO

IN A BUSINESS THAT
IS ALWAYS TALKING ABOUT
TOMORROW,
THESE ARE THE THINGS
WE'RE OFFERING PEOPLE
TODAY.

We want to give everyone in the world access to the power of computing. Not tomorrow, but right now.

That's why we created Microsoft® Windows™

to make computers easy for anyone to use, and why we're putting so much energy into developing Windows 95, the

next generation of the world's most popular operating system.

That's why our best-selling Microsoft Office business software uses IntelliSense™ technology to make everyday tasks even simpler.

That's why we've introduced Microsoft BackOffice, an integrated information management system built around our Windows NT™ Server and

designed to facilitate the way people share and use information within an organization.

That's why we provide database and development tools that allow people to build custom applications integrating the desktop with corporate data.

That's why we've made Microsoft products for the home to give young and old alike better access to this new world of exploration, imagination and fun.

That's why we have an entire division at work developing the technology of the future. Exploring ways to apply software to things like electronic commerce, personal communication devices and interactive television, to name a few. Innovations that will be as common tomorrow as the television is today.

And that's why we're asking people everywhere this question.

Because, ultimately, they will determine where this industry goes next.

TODAY?™

Microsoft®

NT makes headway in Unix strongholds

By Jean S. Bozman

Like a child nibbling on a cookie, the Microsoft Corp. Windows NT 3.x server software is taking small bites around the edges of the RISC market, which has traditionally been filled with Unix-based workstations and servers.

That was evident last week at Comdex/Fall '94 when Unix workstation and server vendors Motorola, Inc. and Tattung Science & Technology, Inc. announced support for NT on PowerPC-based systems.

Move over Unix

Although some vendors already sell Intel Corp.-based systems that run NT, the high-end RISC-based suppliers—including Motorola and Digital Equipment Corp.—are now providing NT platforms as well. Users want these RISC platforms to run engineering applications and database servers, both of which have

been Unix strongholds.

According to analysts, NT is making headway because of its two advantages: a lower start-up cost compared with RISC hardware and lower maintenance costs for users with just one set of NT source code.

"I think it would give us the flexibility of being able to run whatever the application requirements are on a single machine," said Dennis Walsh, chief information officer at Entergy Corp., a New Orleans-based utility. The company has dozens of networked Unix servers and thousands of Windows PCs. Adding NT is a natural move for some RISC vendors, analysts said.

"If there's money to be made and

growth to be had in the NT market, they want a part of it," said Dan Kuznetsky, research manager for Unix and advanced operating environments at International Data Corp. (IDC) in Framingham, Mass. IDC expects NT servers to move from their current fourth place to

No. 2 by 1998 (see chart).

Unix-to-NT software conversions are already under way among workstation application vendors such as Autodesk, Inc., particularly for engineering software, analysts said. Computer-aided design packages run on

Intergraph Corp.'s Pentium-based NT servers, for example, and other vendors are porting software development tools and publishing software to NT.

OPERATING SYSTEMS THAT ARE RUNNING DATABASE SERVERS*	
Unix	\$1B
NetWare	\$113M
OS/2	\$93M
Windows NT	\$16M
*1993 WORLDWIDE LICENSING REVENUE	

Source: International Data Corp., Framingham, Mass.

IBM clarifies PowerPC strategies, direction

By Michael Fitzgerald
LAS VEGAS

Considering it won't ship until next spring, IBM's PowerPC system got a lot of attention at Comdex/Fall '94. In customer presentations and separate interviews, company officials made several surprising statements and clarified their PowerPC strategy.

Among the more illuminating pronouncements were the following:

- IBM has no intention of developing a common operating system to run on the newly unified IBM/Apple Computer, Inc./Motorola, Inc. PowerPC hardware platform, according to John Thompson, IBM senior vice president and head of IBM's PowerPC strategy.
- Delays in OS/2 for the PowerPC did not cause IBM to hold back its PowerPC hardware until next year.
- IBM has no interest in licensing Mac OS for the PowerPC from Apple, according to Richard Thoman, IBM senior vice president and general manager of its PC business.

Elsewhere, a published report last week said IBM would license the Mac OS, but IBM officials denied this saying they were not negotiating with Apple about licensing or bundling Mac OS.

Nobuo Mii, general manager of IBM's PowerPersonal division, said that "the deal I might want to do is to be an agent [for Mac OS], not a licensee. A license means I can access source code, and I don't want to maintain the Mac OS."

Also, according to Thoman, delays in the development of human-centric technologies, such as the Charlie talking head and voice-driven interface [CW, Nov. 14], were "the main reason" IBM did not ship its PowerPC systems in October. He added that OS/2 may not ship with the systems next spring, though its delivery will be "close enough."

IBM officials also said that testing needs and new products in the works dictated the delay of systems based on the new common hardware platform until 1996.

While the delay in shipping unified hardware has caused many analysts to say that the PowerPC partners are effectively ceding the market to Intel Corp., IBM executives naturally downplayed this battle.

"People want me to say which one will win, and what I think is they'll coexist for some time to come," Thoman said.

Still, IBM executives clearly expect to capitalize on Intel's late-decade move to the

P7 chip, which is being codeveloped with Hewlett-Packard Co. IBM officials said today's PowerPC efforts will put them ahead in the RISC game.

Carl Everett, senior vice president of Intel's microprocessor group, disagreed, saying that "PowerPC gives a clear focus to software developers: the high-volume area is the Intel platform."

Everett added that the P7 will be binary compatible with P6, due out next year, which means the chip can run today's software without emulation.



IBM's Richard Thoman said OS/2 may not ship with the PowerPC systems next spring.

Motorola to bundle PowerStack line with Microsoft products

By Stuart J. Johnston
LAS VEGAS

In a move that may help Microsoft Corp. get yet another leg up on IBM, Motorola, Inc. last week announced it will ship its PowerStack line of PowerPC-based machines bundled with Microsoft's Windows NT in the first quarter of next year.

Besides Windows NT Workstation 3.5 and NT Server 3.5, Motorola has agreed to bundle Microsoft's Office productivity applications on some machines and has also acquired a license to bundle the BackOffice server suite, executives from Microsoft and Motorola said.

"I think you're going to see [NT] clearly being the best-selling operating system on Motorola platforms," said Edward F. Staiano, executive vice president of Motorola and general manager of Motorola Computer Group.

Weak response

Users were more ho-hum, expressing skepticism that the move will do much more than give them another set of options in a small but competitive marketplace.

"NT is already available on a number of RISC platforms like Mips [Technologies, Inc.'s] and [Digital's] Alpha, and it will be nice to see it on PowerPC, but I don't know if it changes anything right

NT will also gain strength as a database server for client/server applications in workgroups and departments. "That's going to be NT's initial beachhead," said Thomas Kucharvy, president of Summit Strategies, Inc. in Boston. "But the areas of replicated servers, management servers and enterprise servers will continue to be a stronghold for Unix."

Other Unix vendors are preparing to jump on the RISC/NT bandwagon but will go only if pushed because NT threatens their systems software, analysts said.

Some users are doubtful that the leading Unix vendors will ever fully support NT without being dragged kicking and screaming. Suppliers will "not risk their ability to gain proprietary advantage" by going with an operating system where they do not have control, said David Pensak, principal consultant for advanced computing technology at Du Pont Co. in Wilmington, Del.

away," said Jonathan Vaughn, vice president of applications systems technology at The Chase Manhattan Bank NA in New York.

"From a due diligence perspective, we'll take a look at it. There may be something applicable to what our offices out in the field might do but, in general, it does not excite us a great deal," said Frank Petersmark, manager of technical services at Amerisure & Cos. in Southfield, Mich.



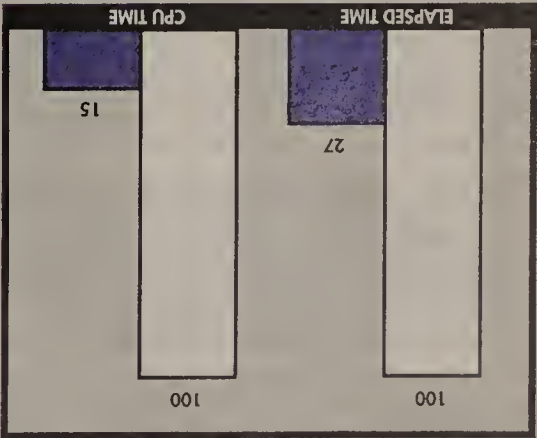
Beta versions of Microsoft's Word and Excel running on Windows NT for the PowerPC were demonstrated at the Comdex/Fall '94 trade show in Las Vegas last week.

Versions of NT Workstation and Server as well as the Office applications are currently scheduled to be available in the first quarter.

However, no date was given for availability of the BackOffice products, which include SQL Server, SNA Server, Systems Management Server and Microsoft Mail Server.

Senior editors Michael Fitzgerald and Ed Scannell contributed to this story.

PERFORMANCE



☐ UNIX System Sort
 ☒ SyncSort

FUNCTIONS

RECORD FORMATS		
	UNIX System Sort	SyncSort
Fixed length binary	NO	YES
Variable length binary	NO	YES
ASCII Text	YES	YES
RECORD PROCESSING		
Selection	NO	YES
Reformatting	NO	YES
Summarization	NO	YES
Grouping	NO	YES
COLLATING SEQUENCES		
Standard ASCII	YES	YES
EBCDIC	NO	YES
User Defined	NO	YES
Multi-byte	NO	YES

UNIX has its advantages, but its System Sort isn't one of them. All it can do is sort ASCII text – slowly!

SyncSort provides the performance and functionality you need to make your commercial UNIX applications work.

To order SyncSort or for a FREE copy of our booklet – *Making Your Commercial UNIX Applications Work* – call us.

syncsort

(201) 930-8200 dept.123

UNIX

The UNIX System Sort

Wide-area routing coming to NetWare

By Suruchi Mohan

■ In an effort to make NetWare a truly enterprisewide platform, Novell, Inc. will support multiprotocol routing capabilities in the soon-to-be-released Version 4.1.

A beta tester at a major bank said last week that Novell will support the next release of the NetWare Multi-Protocol Router, MPR 3.0, in NetWare 4.1. "It allows you to configure different protocols, lets you configure from a single menu [and supports] IP, IPX and AppleTalk," said the customer, who requested anonymity.

Users said they are excited about the inclusion of wide-area routing capabilities in NetWare 4.1, especially should they need to expand their networks.

Dennis Gerrity, MIS director at the law firm of Stinson, Mag & Fizzell in Kansas City, Mo., said routing capabilities

in the core operating system would be a "valuable addition. If we expand our WAN, we would consider [NetWare 4.1] because external routers are expensive. Relying on that functionality in the operating system would save several thousand dollars."

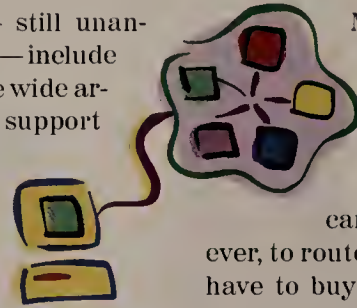
Some of the features of MPR 3.0 — still unannounced by Novell but in beta testing now — include support for IP, IPX and AppleTalk over the wide area; dynamic routing around failures; and support for Integrated Services Digital Network, including a filter facility that does not require the link to be up all the time, the beta tester said.

Thom Stark, president of Stark Realities, a consulting firm in El Cerrito, Calif., said it makes perfect sense for Novell to add these features. Novell announced last month that NetWare 4.1 will include NetWare Link Services Protocol, which re-

duces Routing Information Protocol and Service Advertising Protocol broadcast traffic on the network. The vendor could support other protocols over the wide-area network as well, Stark said.

Novell, however, said it will not embed MPR 3.0 in NetWare 4.1 but will sell it as a separate product after NetWare 4.1 ships next month. However, some of the product's functionality will be inherent in the new release of NetWare.

For example, IP, IPX and AppleTalk can be routed locally with NetWare 4.1. However, to route these protocols over a WAN, users would have to buy an MPR software add-on. NetWare MPR turns NetWare into a software-based router, allowing users to work with existing hardware, said William Donahoo, director of product marketing at Novell in Provo, Utah.



Users seek partitioning for client/server development

By Rosemary Cafasso

When it comes to high-performance client/server development, the combination of Sybase, Inc. and Powersoft Corp. may find it has some catching up to do.

While Powersoft and other tools providers promise to deliver more sophisticated development functions within the next year or two, many users have already turned to a variety of tools vendors to get the capabilities they need today.

Among the most important new capabilities is application partitioning (see chart), which is emerging as a key piece of so-called second-generation client/server applications or true distributed applications. It allows users to design presentation, core application and database services as separate layers — a handy technique for managing the distribution of application functionality across a network.

While applications built with partitioning techniques are still scarce, many users are taking their initial steps into this realm with a range of high-end tools from upstarts such as Forte Software, Inc. and Dynasty Technologies, Inc. as well as Texas Instruments, Inc. and Seer Technologies, Inc.

"We wanted a client/server tool that was object-oriented and supplied a total development environment and was not just a screen-builder," said Bill Bedor, director of information technologies at Medtronic, Inc. in Minneapolis, which has been working with the Forte development platform for nearly a year.

Because there is no standard approach to partitioning, users need to select tools carefully, analysts noted. The level of partitioning automation and

cross-platform support differs widely among vendors, so users could end up with different application modules that cannot talk to one another.

One way that works

At The Travelers Insurance Co. in New York, Laura McSweeney, an IS director, said her staff has been working with TI's Composer development platform, which allows developers to first create a client/server application design.

Composer shows developers how well balanced the code will be and where po-

Application partitioning		
WHAT IT IS	HOW IT CAN HELP	HOW IT CAN HURT
A technique to design software as object modules that can be split up and deployed on different systems on the network.	A major step toward truly distributed applications; can improve application performance and make better use of network resources.	If designed incorrectly, partitioned applications can bog down the network. Also, there are no standards to help users select products.

tential network traffic problems could result. The system then generates code modules for different platforms, such as Cobol code for the back-end IBM DB2 server and C code for the client piece.

"We could look at the performance impact on the network, and then we could change the design without having invested a lot in coding," McSweeney said.

Terry McLane, head of technology at Mercer Technologies, the information services group of William M. Mercer, Inc., is working with the Interactive Development Environment's Object Modeling Technique and partitioning techniques.

McLane's staff created a set of back-end services or modules that reside on Unix servers and are accessed by three different front ends.

"Initially, we put all the code out on the clients, and we realized it would never work," McLane said.

Sybase, Powersoft rattle market

Merger may force rival vendors to improve services

By Melinda-Carol Ballou and Kim S. Nash

The Sybase, Inc./Powersoft Corp. merger last week means that competitive tools vendors will have to kick into overdrive to deliver or improve their goods, and quickly.

The move will be felt most particularly by Sybase competitors Oracle Corp. and Informix Corp., analysts said. However, companies such as Borland International, Inc., which will ship its Delphi PowerBuilder competitor product early next year, were also rattled by the announcement. "The combined Sybase/Powersoft offers a stronger competitive threat to Oracle than either company had been on its own," said Rich Edwards, an analyst at Robertson, Stephens & Co., a San Francisco brokerage.

On the other hand, it may be some months before Sybase and Powersoft can effectively integrate their products and the impact of the merger is completely felt in the market, according to Ed Aely, an analyst at International Data Corp., a Framingham, Mass.-based consulting firm.

Oracle's reign threatened

Prior to the merger, Oracle had been the clear beneficiary of a stumbling Sybase tools initiative. New versions of Oracle's Cooperative Development Environment (CDE) tool, plus its Project X PowerBuilder competitor, are due out early next year. But while CDE offers benefits such as scalability, the current crop of CDE tools are difficult to use, according to industry analysts, and Project X is not yet shipping.

The Powersoft/Sybase merger makes delivery of Project X even more urgent and underscores Oracle's aborted attempt to acquire Gupta Corp. last summer, analysts said.

The merger also makes it more critical for Informix to provide a graphical user interface-based, easy-to-use option. The company recently started shipping its

NewEra tools for Windows, which analysts said are more scalable than competing products.

Some speculated that Informix may now try to acquire Gupta for its SQLWindows low-end development tools and its desktop SQLBase database.

IBM also suffers from a dearth of tools and could use a tool similar to PowerBuilder to gain mind share, analysts said. IBM's Visual Age, like New Era, is not easy to use, although it offers scalable features.

But Sybase and Powersoft will not necessarily have a walk in the park. "They have a lot of work to do to bring a scalable product to the table," Aely said.

Smaller fourth-generation language companies with solid products, such as Progress Software, Inc., Cognos Corp. and JYACC, Inc., are likely to survive in niche markets that result from the gaps in capabilities between low- and high-end tools. But they may feel a pinch without large corporate resources backing them, as the tools market becomes increasingly dominated by monolithic players, analysts added. Uniface Corp., for instance, was acquired earlier this year by Compuware Corp.

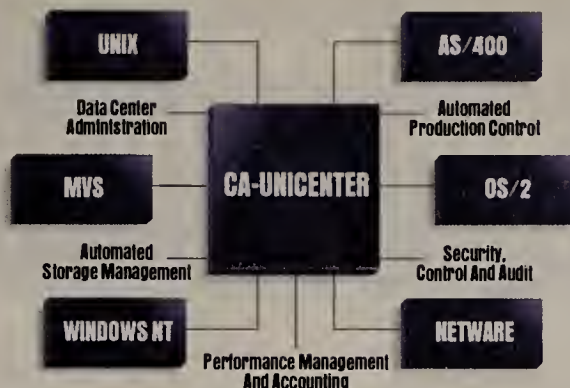
Sybase was smart to merge with Powersoft, said Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Watertown, Mass. "Sybase had to act fast to effectively compete with Oracle and Informix," she said.

Correction

The story "CIOs warned to get their shops in shape" [CW, Nov. 7] omitted mention of the sponsor of the Information Technology Economics conference. It was *CIO Magazine*, an IDG publication.



1. Standardize On A Common GUI Interface That Makes It Easier To Use, Reduce Training Costs And Boost Productivity.

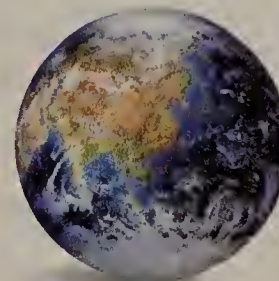


4. Demand An Open Solution That Supports All Key Industry Standards And Protocols.

2. Protect All Your Data With Bulletproof Security Software That Supports Every Platform And Operating System Across Your Entire Enterprise.



3. Choose A Client/Server Application That's Interoperable, Scalable And Portable.

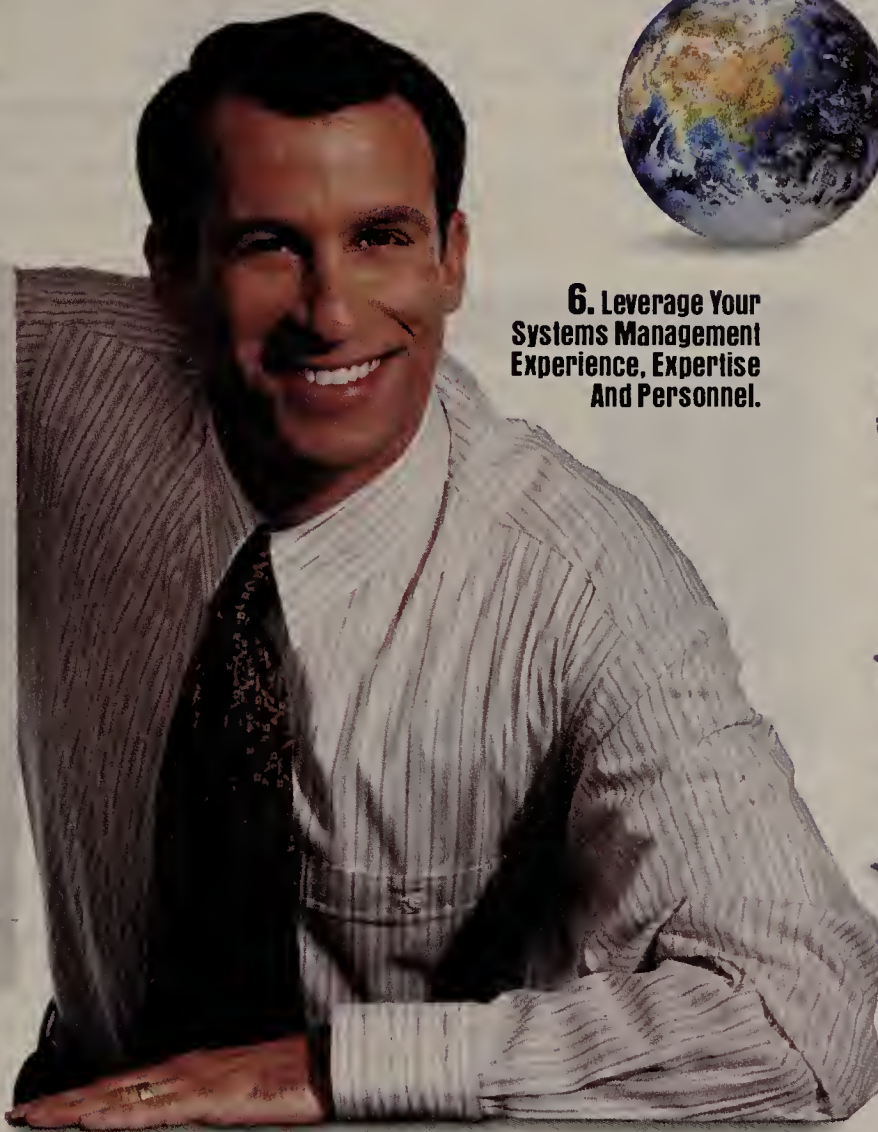


5. Partner With The World's Leading Software Company.

6. Leverage Your Systems Management Experience, Expertise And Personnel.



7. Replace Disparate Point Products With A Single, Integrated, Comprehensive Solution.



Presenting The 7 Commandments Of Systems Management Software.



When choosing your systems management software, you shouldn't have to make a leap of faith. And with new CA-Unicenter®, you don't have to. Because CA-Unicenter is the single, integrated systems management solution that solves all of the challenges of managing client/

server computing across heterogeneous platforms. So call today for more information about the systems management software you can believe in: CA-Unicenter.

Call 1-800-225-5224, Dept. 10102 For More Information And To Register For The CA-Unicenter Software Giveaway.

CA-Unicenter®

Integrated Client/Server Systems Management Software

COMPUTER ASSOCIATES
Software superior by design.

© Computer Associates International, Inc., Islandia, NY 11788-7000. Offer good in U.S. and Canada only. All other product names referenced herein are trademarks of their respective companies. Requirements for Software Giveaway available through toll-free number.

OLAP leads way to post-relational era

The shift to relational databases, which began 10 years ago, is reaching maturity. Now IS managers face a growing clamor for access to the corporate data squirreled away in their flat, two-dimensional tables. But those endless rows might as well be populated with sprouts of corn and sugar cane for all the good they are to the average end user.

What has been hard to accept with relational databases is that despite their name, they yield very few relationships. Rows intersect columns, telling us of a minimal connection, and common attributes across tables provide cross references for joins. But executing a join across large tables taxes most large machines. The returns of a join likewise tax the patience of end users trying to make sense of them.

Consequently, both end users and IS are looking for a way out, some avenue to a post-relational era where relational data becomes accessible, analyzable and meaningful far below the level of the professional database administrator.

Two routes are emerging. One is to employ a multi-dimensional database system to front the relational systems, consolidating data in sets that can be sliced and diced different ways. The other is to move to an object-oriented system that can handle complex data in a format specifically useful to the organization.

Examples of the former include Essbase from Arbor Software Corp. in Sunnyvale, Calif.; UniVerse from VMark Software, Inc. in Framingham, Mass.; and Express from IRI Software in Waltham, Mass. These applications pack data into cube-like formats, adding a third dimension that might yield a time sequence for a given relationship.

The information these multidimensional applications deliver is something like that of an executive information system (EIS) but in a much more flexible, reconfigurable format. They are also designed to use on-line data and hence are referred to as On-line Analytical System Processing (OLAP). The queries fielded by OLAP systems are essentially ad hoc SQL queries rather than pre-defined EIS sets of queries.

Object-oriented systems handling user-defined data come from Object Design, Inc. in Burlington, Mass.; Illustra Information Technologies, Inc. in Oakland, Calif.; OpenODB from Hewlett-Packard Co. in Palo Alto, Calif., and UniSQL, Inc. in Austin, Texas.

National Investment Management in Milwaukee, a private brokerage firm, uses Illustra to track trading patterns in historical records on thousands of stocks. "If you're tracking 20 years of data on 6,000 stocks, the number of rows in a relational table is enormous," said Jim Maldonado, research manager at National Investment. Much of it is in the form of repetitive single-day trades that could be grouped together into much larger units of data, which would reduce the amount of time needed to search the table.

By using an object relational system, Maldonado is able to create his own data type — for example, the trades of a given stock across a predictable time period — and have each stock that is loaded into the database exhibit similar characteristics. This allows more related data to be encapsulated in an object than could be represented by the two-dimensional tables of a relational system.

Without Illustra, "you're not exploiting the inherent properties of the data," Maldonado said, and you pay a performance penalty as a result.

With databases proliferating, the ability to see beyond the reams of data to the underlying information is crucial to continued productivity. The OLAP application and object relational system work with relational databases to point the way to the post-relational era.



Chip strategies

Apple delays adding PowerPC to portables

By Mark Halper



Information systems shops that have been waiting for PowerPC-based portable computers from Apple Computer, Inc. have an even longer wait ahead.

Apple confirmed last week it will not add the PowerPC chip to its portable line until mid-1995, which marks a slip from the spring target promised to users in recent sales presentations.

Jim Gable, an Apple product line manager, declined to explain the delay.

But one source, who asked not to be identified, said Apple and its PowerPC co-developers IBM and Motorola, Inc. have had to redesign the PowerPC 603 to improve its ability to emulate the 680x0 chip that drives Apple's portables and older desktop boxes.

The 603 chip is the low-power consumption version of the PowerPC, intended for use in portables. Now, Apple is shifting to a version called the 603 Plus to replace the 603, the source said.

Mixed reactions

Although some users said they were more focused on their desktop initiatives than leading-edge notebook matters, the delay came as disturbing news to others with ambitious portable computing plans.

"This is very disappointing; it's going to severely impact decisions we're making about rolling out portable computer-based solutions," said Phillip Corehary, a network systems analyst at US West Marketing Resource Group, Inc. in Omaha.

US West has been counting on the PowerPC-based systems to strengthen its sales force automation program. Between 600 and 700 salespeople now use 680x0-based Apple portables to help sell Yellow Pages. But the existing models lack the power needed to run a custom-written US West presentation program, Corehary said.

At Cornish & Carey Residential Real Estate in Palo Alto, Calif., the delay could mean a shift

to Intel Corp.-based portables for real estate agents. They use portables to make on-the-go sales presentations using multiple-listing software, said Bob Duffy, IS manager at Cornish. He said the company prefers to run Windows applications over Mac OS, the next version of Apple's System 7 operating system, but 680x0-based Apple notebooks do not run those applications fast enough.

"It's a shame," Duffy said. "We like the Mac OS; it's very intuitive for our real estate agents. But this is probably going to turn a lot of our agents toward Windows machines."

More than just a portable

John Papa, a partner analyst at financial consulting firm The Carson Group in New York, said he is eager to receive the more powerful notebooks because they will strengthen consultants' ability to provide financial analysis at customer sites.

"It will allow us to do some tremendous crunches of data," Papa said. "With a chip as powerful as the PowerPC, people won't be saying 'it's just a portable, and it's not that great.'"

Users such as Tim Yancy, manager of customer service automated systems at Southern California Edison in Rosemead, were among those paying little heed to the portable delay. "I don't think it materially impacts our plans because we're not really deploying any applications yet that require PowerPC speeds," Yancy said.

For users such as Valerie Takumoto, a technical staff member at The Aerospace Corp. in El Segundo, Calif., notebook concerns boiled down to an age-old issue.

"Everybody is in the mood for speed, but Apple is going to have to make sure the battery life goes with it," she said.

Looking ahead

The PowerBook line, introduced by Apple last spring, will be upgradable to a PowerPC once Apple makes upgrade cards available. Apple recently discontinued black-and-white, high-end 520 and 540 PowerBooks.

Microsoft Marvel is less than its name

One marvel about Microsoft Corp. Chairman Bill Gates' plans for an on-line information network is that the long-expected announcement could generate so much attention despite an unremarkable introductory services mix and unknown pricing.

Then again, as announced last week, The Microsoft Network — code-named Marvel — does include at least one potentially powerful challenge to established on-line network providers such as America

Online, Inc. and CompuServe, Inc. Access to the Microsoft network will be handled directly from the Windows 95 operating system, the next version of Windows, rather than through a separate communications application.

Gates also deflected suggestions that the service would be anticompetitive, arguing that users will have a choice of information network providers.

Microsoft said it would deliver a suite of tools for content providers to develop services

on the network, which will support access speeds of 240 bit/sec. to 14.4K bit/sec.

Microsoft said it wants to expand the size of the on-line market, which currently claims just 4% of U.S. households overall. Its information network would include electronic mail, bulletin boards, "chat rooms," file libraries and Internet news groups, the company said. Members will also be able to access Microsoft tools, product information and technical support.

Babcock is *Computerworld's* technical editor. His MCI Mail address is 575-2737.

ORACLE7 OUTPERFORMS THE COMPETITION.

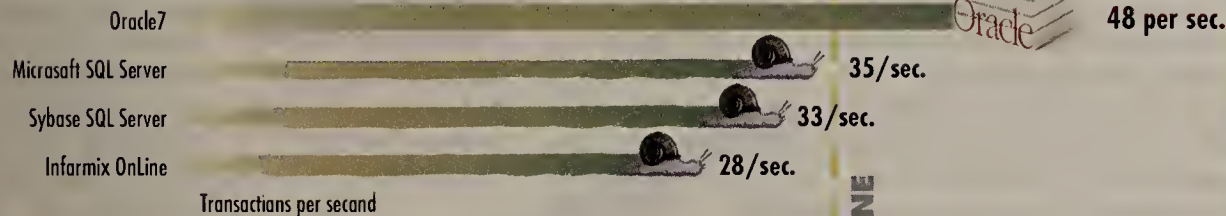
PC MAGAZINE DATABASE BENCHMARK

RANDOM WRITE TRANSACTION MIX

(on 60 active workstations)

WORST

BEST

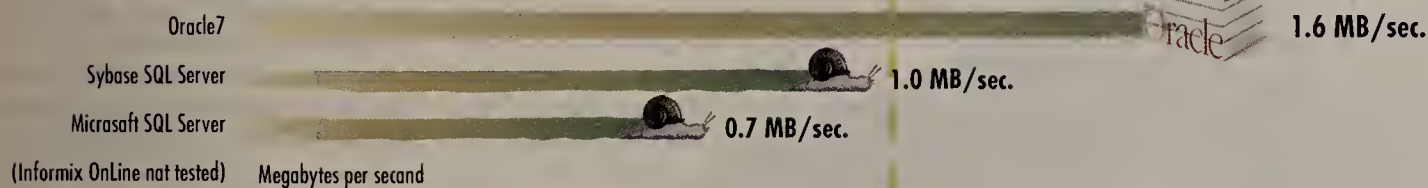


BLOB RETRIEVAL

(on 60 active workstations)

WORST

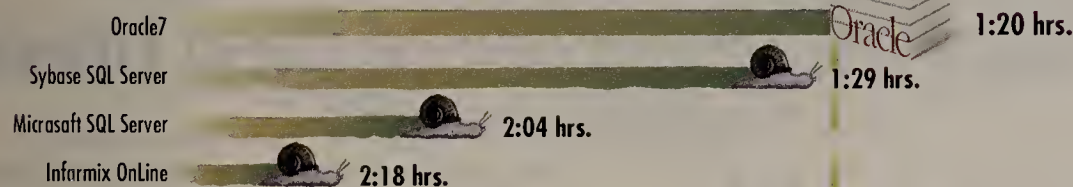
BEST



AD HOC QUERY

WORST

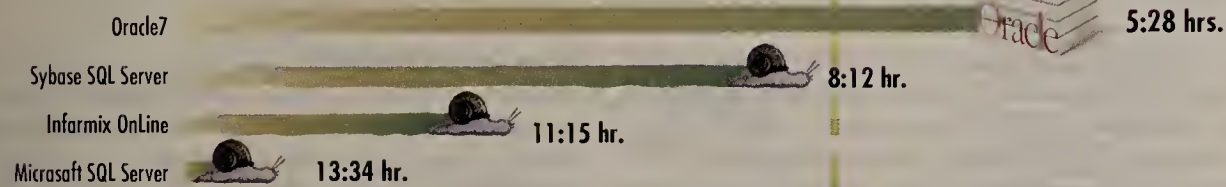
BEST



LOAD AND INDEX

WORST

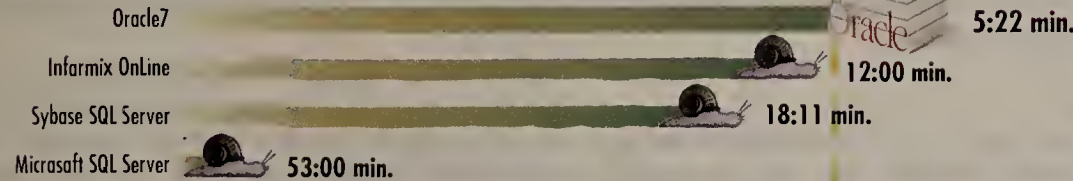
BEST



EXPORT

WORST

BEST



"The best performer on this extremely demanding test* was Oracle7... The engine ran error free and required very little tuning to achieve the measured performance."

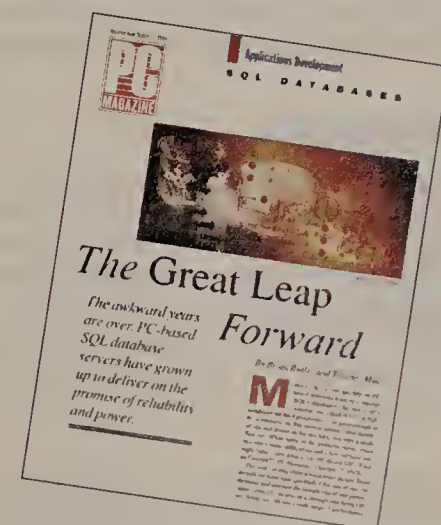
PC Magazine



10/12/93
Oracle7 Server
for NetWare



10/11/94
Oracle7 Server for
NetWare, 7.0.16



For complete PC Magazine results
call 1-800-633-1071 Ext. 8132

News Shorts

AST to halve size of product families

By the first quarter of next year, **AST Research, Inc.** plans to sell only half the number of products it does now, according to Chairman and Chief Executive Officer Safi Qureshey. Among the products getting the ax are all 60- and 66-MHz versions of Pentium-based systems as well as all 486 models below the 66-MHz DX2 processor. Qureshey said AST "got involved in too many things" and needs to concentrate on core customers.

Chicago exchange rolls out handhelds

After several delays over the years, the Chicago Board of Options Exchange last week began delivering wireless handheld computer terminals to its trading pit members. Some 150 wireless units will be deployed by the summer. The exchange eventually expects to have 800 of the systems in place. Wireless terminals, which promise to execute trades faster and provide a secure audit trail, were first tested by the exchange in 1987.

Oracle to resell hybrid DBMS

Oracle Corp. plans to start reselling **UniSQL, Inc.**'s hybrid object-relational database as part of an initiative aimed at large oil and gas companies, Oracle said last week. The Oracle/Upstream program also calls for Oracle to support specifications set forth by the **Petrotechnical Open Software Corp.**, a group of 80 fuel companies and hardware and software vendors working to set computing standards for that industry.

Circle K outsources data center

Circle K Corp., a Phoenix-based convenience store chain, has struck a five-year deal to outsource its data center with **Unisys Corp.** Under the agreement, Unisys will provide data center management services and data communications operations support. In addition, 15 Circle K staffers will transfer to Unisys' Phoenix data center.

Consumer video service deals struck

IBM and **ICTV** have announced a marketing and development agreement by which both companies will provide video-on-demand and interactive services technology to cable operators and telecommunications providers. Separately, **BT** plans to offer commercial interactive television services based on Oracle multimedia software to 2,500 homes in England by mid-1995.

HP announces record revenue

Hewlett-Packard Co. ran up record quarterly revenue of \$7 billion for the company's fourth quarter, ended Oct. 31 — making it a \$25 billion company for the year. Earnings were \$476 million, 60% higher than for the same quarter last year. HP's global markets accounted for 51% of revenue in the fourth quarter, while strong printer, PC and Unix server sales boosted the bottom line, analysts said.

SHORT TAKES **Control Data Systems** in Arden Hills, Minn., will announce next week at E-Mail World in Boston a new business division for electronic data interchange. . . . **General Electric Co.** will spend \$1.3 million over three years for **Computervision Corp.** computer-aided design software and training. . . . **Digital Equipment Corp.** won a five-year contract to manage the infrastructure of **Microsoft's** on-line services, called **Microsoft Network**. The company competed with **Andersen Consulting**, **Electronic Data Systems Corp.** and **Sequent Computer Systems, Inc.** and will manage the data center, help desk and command center, which houses 200 multivendor servers.

Job hopping key to IS success?

By Julia King

Last week was a time of musical chairs in the corporate offices of **Procter & Gamble Co. (P&G)**, **Xerox Corp.**, **Microsoft Corp.** and **Bell Atlantic Corp.**, which all lost or gained highly experienced information systems executives.

And the dance has only just begun, according to recruiters and consultants, who predict a continuation of high-profile job hopping between firms by top IS talent.

"Historically, the odds have not been good for CIOs getting promoted within their companies," said Tom Friel, managing partner of executive recruiting firm **Heidrick & Struggles, Inc.** "The only real option to advance their careers is to change companies."

An upward migration

Longtime **P&G** Chief Information Officer **Robert I. Herbold** is joining **Microsoft** as chief operating officer. A 26-year veteran of the Cincinnati consumer goods company, Herbold, who is experienced in both consumer marketing and IS, will become a member of **Microsoft's** office of the president, reporting directly to Chairman and Chief Executive Officer **Bill Gates**.

Meanwhile, in taking over as

vice president of information processing at **Bell Atlantic**, **Laraine Rodgers**, former CIO of U.S. customer operations at **Xerox Corp.**, moves from an \$8 billion business unit to a \$13 billion enterprise at the forefront of the red-hot telecommunications industry.

Based in Silver Spring, Md., Rodgers will oversee virtually all of the telecom giant's computer and network operations. She will also play a key role in consolidating seven data centers into two, a downsizing plan announced earlier this year by **Bell Atlantic CIO Ralph Szygenda** [CW, Aug. 22].

Xerox said it has not yet named Rodgers' replacement.

"The telecom industry, in my opinion, is the place to be," Rodgers said last week. One of the reasons she joined **Bell Atlantic** was to expand both her responsibilities and her chances for career advancement, she said.

"I was responsible for delivering about \$200 million in services at **Xerox** and initially had 500 re-

ports. Some of those were outsourced and/or replaced. I had accountability but not the staff," Rodgers said.

"**Bell Atlantic** is larger in terms of the numbers of people," she noted, adding that the support staff she now oversees numbers about 1,000 people spread over seven states.

According to **Kay Lewis Redditt**, president of **CogniTech Services Corp.**, an IS consultancy in Easton, Conn., Rodgers' expanded responsibilities track the experience of other high-level IS executives who have switched companies, often to assume the same job title.

Inside their own companies, all CIOs' technical acumen and business knowledge "tend not to be recognized," Redditt said.

By way of example, she noted that 60% of CIOs are excluded from high-level strategic planning activities and decisions, including those that involve technology.

Once they change companies, however, "CIOs are generally given a better chance," she said.



Bell Atlantic's Laraine Rodgers will oversee redeployment of IS resources

Techno-hip is choice of new breed

By Thomas Hoffman

You might say **Daniel G. Hoffman** is a trendsetter.

The 38-year-old chief executive of **Uni-Data and Communications, Inc.** has closely gauged the role technology plays, both inside and outside the corporate walls of the Flushing, N.Y. systems integrator. The past four years have witnessed a wild ride of 200%-plus annual revenue growth for the \$6 million firm.

Hoffman represents a new breed of corporate chieftains who are passionate about the impact technology has made on their companies' achievements. "Our charter is to make sure that technology is an enabler for our customers, so it's important that we take full advantage of it internally," he said.

For example, Hoffman has seen to it that **Uni-Data's** PCs are linked via leased lines to customer networks, such as the forthcoming Unix-based trading floor it is helping to roll out at **The Chase Manhattan Bank NA** in New York. This helps ensure that all of the workstations and servers it has installed for the \$102 billion bank are running smoothly.

From the hip

Indeed, it is a brash new style of techno-hip management that has helped **Uni-Data** and other upwardly mobile companies become successful so quickly, according to a recently completed survey conducted by **Coopers & Lybrand L.L.P.**

Coopers' "Trendsetter Barometer" survey of chief executives at 410 of the fastest growing U.S. firms revealed that successful start-ups have risen quickly — thanks to their leaders' unabashed approach to in-

formation technology in their organizations.

For example, chief executive officers at fast-growth firms estimated that their annual investments in information technology represent an eye-popping 7.8% of overall revenue. Even though most of these companies are not saddled with the enormous overhead of larger firms, their relative technology investments are still considerably higher than the standard 1% to 3% at established companies.

Flexibility payoff

Smaller companies "can scale up and down with PCs, implement easy-to-install networks and make [technology] combinations where needed," said **Pete Collins**, director of entrepreneurial advisory services at the New York-based **Big Six** accounting firm. "That's one of the benefits of being a smaller company and one of the main reasons they can compete more effectively today with giants."

That type of flexibility appears to be paying off for **Eeco Products, Inc.**, a developer of environmentally safe household and industrial cleaning products in Freehold, N.J.

Alfred Heyer, founder and president of the 3-year-old firm, believes his company's grass roots PC mentality helped it win market share from industry goliaths such as **Procter & Gamble Co.** and **Dow Chemical Co.**, both major conglomerates saddled with a bevy of legacy systems.

"The use of smaller systems has given us an edge" over some industry goliaths from which **Eeco** has won market share, Heyer said. The company's revenue is on course to increase tenfold to \$3 million when its fiscal year ends in June 1995, he noted.

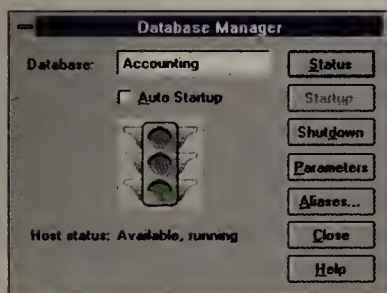
NOW MANAGING THE WORLD'S MOST POWERFUL DATABASE IS CHILD'S PLAY.



ORACLE7 WORKGROUP SERVER™: REALLY, REALLY SIMPLE YET VERY, VERY POWERFUL.

Oracle7 Workgroup Server replaces SQL database complexity with point and click simplicity.

Pretuned and preconfigured for results right out



Friendly graphics indicate systems status.

of the box, Oracle7 Workgroup Server is the ideal database for workgroups. Best of all, it's

100% compatible with all

leading Windows®

applications and tools. Add a powerful array of graphical administration

tools plus Oracle7's blistering speed and infinite scalability (PC Magazine's Editors' Choice 1993,

1994 and PC Week's Analyst's Choice 1994), and you have an affordable, simple yet powerful server the competition may

promise, but can't deliver.

With prices starting at \$995, there's no

better solution for managing your workgroup information.



Simple checkboxes & pick lists make administration easy.

For a
FREE
informational
video call
1-800-633-1071 ext 8169.

ORACLE



10/11/94 Oracle7 Server
for NetWare 7.0.1b

IBM begins AS/400 cluster rollout

By Craig Stedman

IBM has begun to deliver clustering technology for the AS/400 to meet the demands of large customers for more mainframe-like computing power and systems management capabilities. But it will take another two to three years to get full clustering support in place.

Initially, IBM is quietly rolling out a fiber-optic interconnect that allows disk storage to be shared between multiple AS/400 systems. OptiConnect/400 can support either peer-to-peer links of AS/400s with their own internal storage or a tiered approach in which a single database server is connected to different application engines, according to IBM.

OptiConnect/400 should be installed at about 15 customer sites by year's end, IBM officials said. General availability is tied to next spring's scheduled introduction of a line of PowerPC-based AS/400 machines.

David Andrews, managing director at D. H. Andrews Group, Inc. in Cheshire, Conn., said early interest in OptiCon-

nect/400 is limited to a couple dozen of the largest AS/400 shops. But the market for the product could expand "if IBM pushes [mainframe downsizing] harder with the AS/400," he added.

More complete clustering capabilities will follow, including support for managing a group of AS/400s as a single system. That item is high on the wish lists of some large shops that run their businesses on multiple AS/400s, but it will not emerge from the laboratory until 1996 or 1997, IBM warned.

The lengthy wait could prompt Countrywide Funding Corp., one of the earliest OptiConnect/400 users, to put the interconnect on hold once a PowerPC-based AS/400 that can meet its workload becomes available, said Bob Membrilla, AS/400 systems architect at the Pasadena, Calif., home mortgage company.

Countrywide has been beta-testing OptiConnect/400 since June and is in the final stages of putting it into production to link an existing AS/400 F97 with a new F80 for use in loan servicing, Membrilla said. However, OptiConnect/400 may be used mainly as a bridge to the PowerPC-based hardware, he added.

"OptiConnect still involves managing two different systems, and we'd like to keep it to one," Membrilla said. The single-system image support promised for the future "looks real appealing based on what we've seen," he noted. "But being three years out, it's hard to say for sure whether we'll use that."

More than meets the eye

With 18 AS/400s installed in its data center, Enterprise Rent A Car Co. in St. Louis is also itching to get full clustering capabilities, said Mare Cohn, senior vice president of information systems. But he added that the complex nature of the technology makes IBM's slow pace understandable.

Development work "seems to be moving along, and it's heartening to hear that [clustering] still lives," Cohn said. "I appreciate the caution that IBM is showing here, because there's more to this than meets the eye."

OptiConnect/400, which Enterprise plans to install in December, "is still a fairly narrow thing" for distributing data between AS/400s, Cohn said. However, he said the 220M bit/sec., bus-to-bus interconnect should be a big improvement over a current software-based approach that has "intolerable" performance and puts a major programming burden on customers.

Industry coalitions oppose IBM trying to roll back the 1956 Consent Decree. See page 66.

Introducing Version 4.0

Personal Communications/3270

Emulation

Make a list of everything an emulator should be. Then add a few more lines. With the IBM® Personal Communications/3270 V.4.0, you can have it all—and more.

Power and Flexibility.

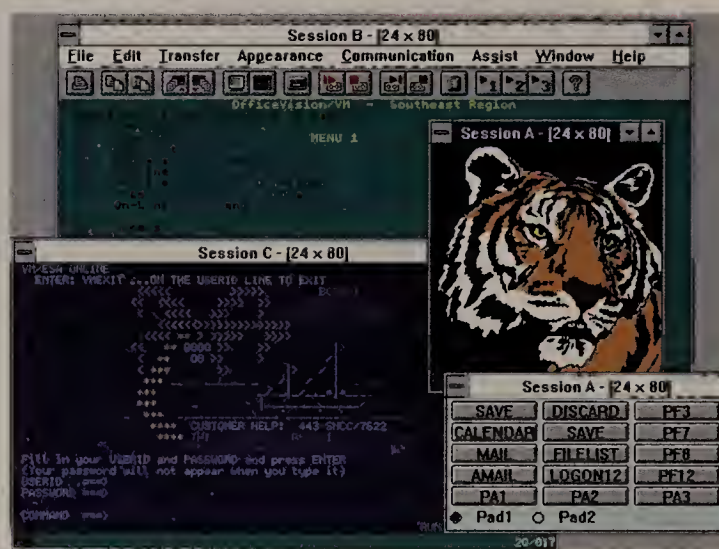
Now you can access the host mainframe from more locations, more efficiently and with more function than ever before. Running as a native DOS or Windows™ application, IBM PC/3270 allows PCs to emulate IBM 3270 display terminals, transfer files with the host, automate process

via the emulator APIs, and function as a LAN gateway. With its wide range of connectivity, IBM PC/3270 is also quite a liberator. There's support for IPX/SPX (NetWare® for SAA®), TCP/IP, and Async support for out-of-office connectivity.

There's also the NEW Personal Communications Toolkit for Visual Basic®, which makes it easier for Windows programmers to integrate host data and text with workstation applications.

Great Support and Savings.

You'll also find all the support you need for the latest technologies, including the latest modems (V.32BIS and V.42BIS) and PCMCIA credit card adapters. And there are lower upgrade prices when you de-



Take a look at all that PC/3270 has to offer, and you'll see why it's the latest emulation sensation.

beyond

side to migrate from non-IBM (Attachmate®, DCA®, Wall Data®, etc.) or IBM 3270 terminal emulators. To find out more, call 1 800 342-6672. In Canada, call 1 800 465-7999, ext. 999. With so many features, the PC/3270 is clearly greater than your average emulator.

expectation.

IBM

IBM, SAA, and V.42BIS are trademarks of International Business Machines Corporation. NetWare is a registered trademark of Novell Inc. MS-DOS and Visual Basic are registered trademarks of Microsoft Corp. DCA is a registered trademark of Digital Communications Association, Inc. Attachmate and Wall Data are registered trademarks of their respective companies. © 1994 IBM Corp. All rights reserved.



Micro Focus Tools for Mission Critical Systems

Whether it's an ecosystem or a business information system, if you depend on it, you can't afford to take any chances. To survive, you need systems that are robust, stable and built to last—sometimes much longer than anyone thought.

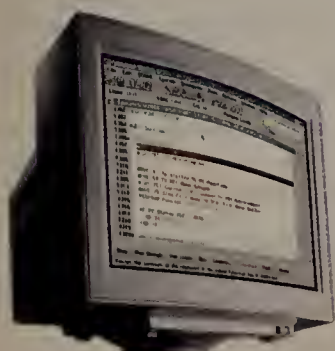
The most elegant systems weren't built overnight.

If you're targeting mission-critical business applications to the network, UNIX® systems or the host and you can't afford to take chances with quick fixes and trendy technology, there is only one real choice: Micro Focus.

Micro Focus workstation-based tools provide developers with the world's best programming environment. Our tools are designed to maximize productivity, usability and application quality. Whether you are using our rapid application development facilities to build new client/server systems or using our legacy tools to manage or migrate existing applications, Micro Focus gives you the power to create elegant systems.

The Micro Focus programming environment provides a paradigm for solving problems that leverages your current programming resources. With it, your entire business system will be flexible and powerful enough to meet your needs today and beyond the foreseeable future.

See for yourself... Contact Micro Focus at 800 MFCOBOL Ext. 1200 and ask for the Micro Focus Interactive CD. On it, you'll find descriptions and interactive demonstrations of Micro Focus development tools.



IS cheers GOP rule

CONTINUED FROM COVER 1

at Allied Signal Technical Services Corp. in Columbia, Md. "They won't let this momentum that's been created in the Clinton administration fall by the wayside."

Industry executives, meanwhile, give the Democrats a mixed report card.

"I was one of the Republican CEOs in Silicon Valley that supported Clinton in 1992, and I've been really impressed with his handling of trade issues and the economy," said Edward R. McCracken, chief executive officer at Silicon Graphics, Inc. "The disappointment is that he was not able to work with the Democratic Congress."

McCracken said a Republican Congress is more likely to satisfy his legislative wish list, which includes telecommunications deregulation, reduction in capital gains taxes, curbs on abusive shareholder lawsuits, rollback of a proposal to change the accounting for stock options and approval of the General Agreement on Tariffs and Trade (GATT).



Eric Singleton, IS director at Allied Signal Technical

Some attached less importance to the new Republican majority. "I don't see [the election] having any effect," said Microsoft Corp. Chairman and CEO Bill Gates. "It won't change the date we ship Windows 95 or the features, either."

However, getting the nation's financial house in order is a key concern for the industry. "To the extent this Republican majority takes a real bite out of the deficit, the business world will think that's good for interest rates, tax rates and cost of capital," said Michael Maibach, director of government affairs at Intel Corp.

"The tax bill of 1993 raised Intel's taxes by millions of dollars," he said. "We don't think that was very helpful."

Maibach said Intel's top priority in the taxation realm is tax simplification, something Rep. Bill Archer (R-Texas), incoming chairman of the House of Representatives Ways and Means Committee, said he plans to pursue.

Furthermore, the GOP's "Contract with America" calls for a 50% cut in the capital gains tax, a measure likely to be passed by the GOP-controlled tax committees. President Clinton, however, may oppose it.

Prospects for the high-tech industry's beloved tax

universities for R&D in basic new technologies.

One big question is whether the power shift in Washington will jeopardize plans for the multibillion-dollar information superhighway.

"My greatest fear is that the whole thing becomes politicized," said James A. Unruh, chairman and CEO of Unisys Corp. "Because it's been such a high-profile area of support of the Clinton administration... there might not be the same support and it may hurt the rate of progress."

Craig Benson, chairman and chief operating officer at Cabletron Systems, Inc., said Clinton's information highway efforts are likely to "go down the tubes. Clinton is going to focus on what will get him votes, and the superhighway will not do that for him."

Industry lobbyists are also worried that with hard-line conservatives controlling the House agenda, the prospects for lifting export controls will go from bad to worse. "This is the most uphill, adverse area for high-tech business, without any question," Peyton said.

That is because moderate Democrats support the relaxation of Cold War-era export controls, while conservative Republicans worry more about

technology falling into the wrong hands. Even so, moderates have failed for three Congresses in a row to pass export control reforms.

Most observers agreed that deregulation of the communications industry is likely to thrive under Republican stewardship. "It will proceed faster by at least a factor of two," predicted Michael Roberts, networking vice president at Edumcom, a Washington-based association of universities.

"Republicans would take the controls off, let the players compete and then look for market damage," he said. "The [Democratic] view is that this is too hazardous — too many little people will get screwed — so you have to let the regulatory barriers down very slowly and calibrate it every inch of the way."



Craig Benson, Cabletron's chief operating officer

What will become law?

Republican leaders have said that passing telecommunications legislation will be one of their top priorities. The bill is expected to be much shorter than last year's ultracomplex Senate version, which bulked up to 160 pages and then collapsed.

Senate Republicans are now talking about a 30-page bill to free the regional Bell holding companies from current restrictions and encourage more competition. Rep. Jack Fields (R-Texas), who is expected to take over the House telecommunications subcommittee, said he is committed to an aggressive schedule to pass a telecommunications bill by April.

"Anything that comes out of the new Congress will be more simple and probably more deregulatory than in the past," said one telecommunications manager, who requested anonymity. "But Republican priorities will occupy a lot of time, so there's no assurance telecom legislation will be on a fast track in Congress."

Charles Wang, CEO of Computer Associates International, Inc., summed up the view of a number of CEOs, saying, "There is a message being sent by the American voters that big government ain't working today. Whoever is there [in power] better work together and make significant changes in the way things get done. Otherwise, they'll boot them out."

Computerworld staff contributed to this report.

HOW WILL A REPUBLICAN MAJORITY IN CONGRESS AFFECT THESE AREAS OF BUSINESS INTEREST?

BASE: 100 IS MANAGERS FROM FORTUNE 1,000 COMPANIES

	HELP	HURT	NO EFFECT
The information superhighway	43%	10%	32%
Vice President Gore's Reinventing Government Initiative	33%	30%	25%
Various tax policies and cuts	80%	5%	8%
Telecommunications regulatory climate	61%	8%	15%
Export controls/trade policies	47%	16%	19%

"Don't Know" responses omitted

Source: Computerworld survey

credit for R&D expenditures are even less clear. Although there is bipartisan support for making that tax credit permanent, budget pressures will be fierce.

"The Republicans have supported a permanent R&D tax credit for a while. We sure hope that will emerge in some sort of tax package, but there is always the question of how you pay for it since there will be a short-run revenue loss," said David Y. Peyton, a vice president at the Information Technology Association of America in Arlington, Va.

The Contract with America also calls for scaling back programs that smack of industrial policy, such as the U.S. Department of Commerce's Advanced Technology Program (ATP). The ATP gives grants to companies and

Gingrich touts on-line government

By Mitch Betts
WASHINGTON

Move over Al Gore. Newt Gingrich, the Georgia Republican who is in line to be speaker of the House of Representatives, may be Washington's next techno-czar.

Already, Gingrich has talked about putting congressional bills and reports on computer networks — perhaps the Internet and computer bulletin boards — to improve public access.

That way, proposed legislation will be available to "every citizen in the country at the same moment that it is available to the highest-paid lobbyist in Washington," he said in a Nov. 11 speech.

The technical details remain to be worked out, but the Georgian's determination is fierce. "There's no objective reason that institutions of government have to be two or three generations behind the curve in information systems and management," Gingrich said. "But they are."

With his helmet of white hair and abrasive style, Gingrich calls himself a "conservative futurist" and peppers his speeches with terms like information society and telemedicine. "We have to accelerate the transition from a second-wave mechanical, bureaucratic society to a third-wave information society, to use [author]

Alvin Toffler's model," he said.

On a recent TV talk show, Gingrich illustrated his point that rural America is becoming a technology-based economy by noting that PC maker Gateway 2000, Inc. is the largest employer in Sioux City, Iowa.

This rap is music to the ears of at least one industry lobbyist. "For the new speaker to realize that even in a

rural community that information technology has an important place in the economy and employment — that is certainly a signal that he recognizes the part that information technology plays," said Ted Heydinger, vice president for government relations at the Computer and Business Equipment Manufacturers Association.

But is it just talk? "A lot of Gingrich's rhetoric sounds really great, but we'd like to see a better tie-in between the votes and the rhetoric," said David Y. Peyton, a vice president at the Information Technology Association of America. He said Gingrich has not been helpful on two

industry priorities: passage of international trade legislation and relaxing export controls.

"It's one thing to wax eloquent about global markets," Peyton noted. "But there isn't a serious legislative program that includes getting rid of some of these unilateral controls. So what good is the rhetoric?"



Future Speaker of the House Gingrich says he wants to bring on-line information to 'every citizen'

KATHERINE LAMBERT



THE GREATEST PERFORMANCE STORY EVER TOLD.

On Wall Street, 19 out of the top 20 brokerage houses rely on Sybase. Today, it's no exaggeration to say Sybase dominates the trading floor.

And World Cup Soccer chose Sybase to drive its global information network — in front of 3 billion people.

Wherever businesses must access and manage massive databases in mission-

WHAT THE CUSTOMERS SAY:

"The kind of performance Sybase delivers on Wall Street helped convince TCI to go the same route."

— Sadie Decker, V.P. and CIO of TeleCommunications, Inc., the nation's largest cable TV company.

"Sybase gave us the price/performance we needed to justify our massive reengineering effort."

— Jack Hazel, Senior Systems Analyst, Illinois Employee Benefits Corp., which manages more than \$1 billion for midwestern unions.

critical applications, you'll find Sybase.

Now consider *your* OLTP and decision support applications. If you want world-class performance, you need Sybase. For more performance highlights, call 1-800-SYBASE-1, ext. 6210.



SYBASE

THE ENTERPRISE CLIENT / SERVER COMPANY

Network Notes gets market workout

Users spared wide-area network links, added Notes servers

By Lynda Radosevich

When AT&T Corp. and Lotus Development Corp. announced plans to create a Notes network outsourcing service last March, Helen O'Connor jumped to offer her firm as a test site.

O'Connor, a vice president and director of telecommunications at First Albany Corp., wanted to expand the financial services firm's Notes network from its Albany, N.Y., headquarters to remote offices and client sites. However, she did not want to maintain the wide-area networks and multiple Notes servers that such an expansion would require.

"I'm thinking of keeping my MIS people sane and happy," O'Connor explained.

It turned out that a number of users shared that feeling. So First Albany and several other user companies joined a limited AT&T Network Notes market trial, which AT&T and Lotus officials announced at Comdex/Fall '94 last week. It is the first in a series of testing phases that, if successful, will result in a commercially available service near the end of next year, they said.

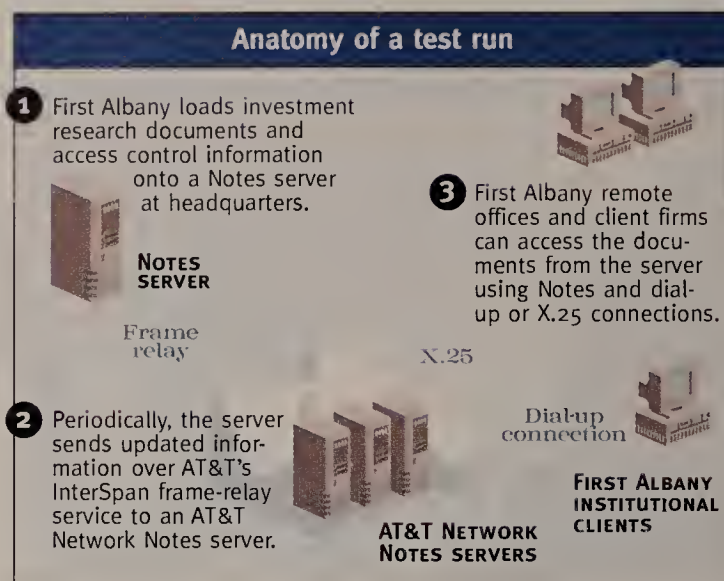
AT&T Network Notes is a WAN service based on Notes and AT&T's InterSpan network.

Joining First Albany are Compaq Computer Corp., Individual, Inc., 3M Co., Egghead Discount Software and several third-party development partners, including Trinzic Corp. and Worklink, Inc. [CW, Oct. 24]. The companies will help test everything from AT&T's administration of the service to the frame-relay connections and Notes server reliability. In turn, the firms hope to get a leg up on their competition by using Network Notes to more easily distribute their own electronic products and services.

"We can't say anything more about it because it's a competitive issue," a 3M spokesman said.

Meanwhile, AT&T is planning the following measured approach to the network rollout:

- Beginning this month, the select handful of trial companies will test the service using Notes 3.1 server software running on OS/2 and AT&T Global Information Solutions server boxes. The companies will be allowed to connect to only 10 to 20 end points.
- In January, about two dozen customers will be added,



ed, and they will be able to reach an unlimited number of end points. The idea is to test AT&T's ability to deliver software and get users up and running.

- In the third quarter of next year, following the delivery of Notes 4.0, AT&T will begin rapidly expanding the number of user sites and continue to offer unlimited end point access.

Throughout the trial, the companies will enter information and maintain access control lists in a Notes server. Up to 20 times a day, the server will update an AT&T Network Notes server, from which remote users can access the information via Notes client software (see chart). The benefit is that the user sites do not have to maintain the wide-area connections and the remote sites do not require their own Notes servers.

For those reasons and others, O'Connor said she asked to join in the trial. First Albany already uses Notes internally to route investment research reports through a review cycle. Now it plans to use AT&T Network Notes to distribute up to 10 reports a day to field offices and clients that already have Notes. O'Connor did not have specific pricing information but estimated that it would cost roughly the same as running the service in-house only it would result in fewer administrative headaches.

KPMG adopts an enterprise groupware system, but it's not the one you think. See page 58.

IBM Workgroup line finally lands in beta

By Suruchi Mohan

■ Having long proclaimed to the world that its Workgroup family of products was coming, IBM announced last week at Comdex/Fall '94 that they are in now beta testing.

IBM's Workgroup line is a combination of information management, work management and communications products, all designed to let users plug and play. At the heart of the series is Ultimail, a client/server messaging system that ties into the already-shipping Message Queuing Series. The latter provides queuing and log-in support for the messaging server and can also act as a backbone for other applications.

In addition, IBM's Workgroup includes FlowMark for workflow management, Visual Document Library for document management and FormTalk for forms routing.

Difficult sale

However, IBM will face a tough sales effort once it finally ships the products given its late entrance into the workgroup market, where it will compete with the likes of Notes, said Michael Rothman, a program director at Meta Group, Inc. in Reston, Va. IBM will have to explain to its sales force, which already resells Notes, why they should sell this IBM product.

Joe Waynick, assistant vice president of technical support at Union Bank, a large IBM shop in Monterey Park, Calif., already has an electronic-mail platform in place. "My preference is a one-vendor solution in a multiplatform [environment], but IBM didn't have an offering" when the bank was evaluating products more than a year ago, he said.

Union Bank is moving into the workgroup arena, and Waynick now plans to evaluate Notes and IBM's Workgroup products.

Rothman agreed that IBM's offering would be important for "true-blue shops who still buy into a single vendor." But, he added, they are late, and their limited platform support will initially restrict their market domestically. IBM has said that its workgroup server products would run on OS/2 and AS/400 operating systems initially and on AIX by late next year [CW, July 11].

Internationally, however, its products may be seen as a good plan for migrating to the client/server workgroup environment. IBM's Message Queuing Series offers a good platform for workgroup-type applications, Rothman said.

Windows 95 applications not compelling so far

By William Brandel

While the marketing bonanza for Windows 95 software was in full swing last week at Comdex/Fall '94, vendors have so far offered no compelling reasons for customers to upgrade to upcoming Windows 95 applications.

"I haven't seen or heard anything about what will be in Windows 95 applications that would make me choose those over OS/2," said Matt Boozer, an applications programmer at Chevron Corp. in San Francisco. "The driving factor seems to be that there will be a massive amount of applications that run with Windows 95."

Officials from Microsoft Corp., Lotus Development Corp. and WordPerfect, the Novell Applications Group, all said they are still undecided on the specific features that will

make up their Windows 95 products (see chart). Windows 95 is Microsoft's next generation of Windows.

"I saw a number of the Windows 95 applications, and I can't remember anything interesting that leapt out," said Jeffrey Tartar, editor of "Soft Letter," an industry newsletter in Watertown, Mass.

The vendors all made efforts to drive home the point that hardware upgrades will not be required to run Windows 95 — a big concern for users. In a user survey conducted for *Computerworld* last summer, as many as 46% of 100 information systems managers said they expected to upgrade their systems in order to run Windows 95.

But at the show, Microsoft demonstrated its Office applications multitasking on a beta version of Windows 95 running on a 486 laptop. WordPerfect officials said users would be able

to run Windows 95 applications comfortably with 8M bytes of RAM.

All three vendors said they will at least support the seven features that Microsoft has mandated for Windows 95 compliance. Without such compliance, the vendors will not be able to use the Windows 95 branding.

The vendors demonstrated some of these capabilities at Comdex. Lotus, for example, showed support for long file names in its applications. WordPerfect demonstrated a multithreaded, 32-bit version of WordPerfect 6.1 running on Windows 95.

While multistreaming and 32-bit mode processing may improve application performance, such benefits are not easily demonstrated.

Tartar noted that most developers are targeting basic compatibility with the new operating system their first time out rather than jazzy new applications for it.

"There's nothing that revolutionary being done," acknowledged Gary Gibb, director of PerfectOffice development at WordPerfect.

Vendors encourage third-party suite add-ons. See page 39.

The Windows 95 application compliance list:

- ▶ Long file names
- ▶ Windows look and feel
- ▶ Common messaging call support
- ▶ OLE 2.0 automation support
- ▶ Ability to run applications on Windows 95 and Windows NT
- ▶ 32-bit mode
- ▶ Plug-and-Play compatibility
- ▶ Universal naming convention support

Alliance raises hopes, red flags

CONTINUED FROM COVER 1

Sybase ate a bit of humble pie last week, added Aaron Zornes, a senior vice president at Meta Group, Inc. in Burlingame, Calif. "They needed PowerBuilder because they haven't been able to deliver on the tools side," he said.

Stu Schuster, executive vice president of marketing at Sybase, acknowledged in an interview last week that "part of this was a result of being slow to market" with Sybase's own graphical development tools.

No competition

Other market realities also dawned on Sybase.

Even if Build Momentum shipped immediately, as Sybase officials claimed it was about to, the product would be hard-pressed to compete financially with existing tools, said Mark Hoffman, Sybase chairman, president and chief executive officer.

"If Build brought in \$20 million in sales for 1995, that would be tremendous

panies becoming one. They questioned whether PowerBuilder will continue to support all databases equally.

"As an Oracle user, I am highly disappointed," noted Charles Snowden, manager of marketing information systems at Ciba Textile Products Corp. in

Greensboro, N.C.

Sybase and Powersoft officials vehemently denied that PowerBuilder will work better with Sybase's SQL Server than with databases from Oracle Corp. or Informix Software, Inc., IBM's DB2 or other databases.

"I can guarantee our customers that from the Powersoft point of view, we will have a level-playing-field policy," said David Litwack, Powersoft's president. "The ball is in the other database ven-

dors' courts to be prepared to work with us."

Still, some non-Sybase users wondered where they stand.

"We don't want PowerBuilder to be held captive by Sybase," said Blayne Maring, assistant vice president of architecture at GTE Telephone Operations. Informix's Informix-OnLine is the primary relational database at the Irving, Texas-based division of GTE Corp., he said.

Red flags flutter

While Sybase and Powersoft plan to pool their finances, that does not mean integrating their products will be easy. Key user concerns include the following:

WATCOM, Powersoft's single-user database, might be phased out if Sybase-specific features prove too tough to add to it.

BUILD MOMENTUM, Sybase's own application development tool, could be scuttled.

ENTERPRISE MOMENTUM, Sybase's upcoming modeling tools, must be reworked to accommodate PowerBuilder.

growth. But compared to Powersoft's \$200 million expected in 1995, we would still have a long way to go," Hoffman said.

Whether to ship or scuttle Build Momentum is a decision likely to be made by the first quarter of next year, said Robert Epstein, Sybase's executive vice president. It was sold into a limited set of customer sites and is now officially on hold, he said.

High hopes

For some users, the merger raised hopes that client/server systems may become easier to manage.

"One of the biggest problems in client/server can be finding where the problem is," said Paul Ratner, vice president of corporate information systems at Metropolitan Life Insurance Co. in Parsippany, N.J. "This is great to have one company own a larger piece of the client/server process."

Yet some users among the nearly half of Powersoft's estimated 100,000 installed base who do not run Sybase SQL Server were not as keen on the two com-

Thinking Storage?



Think Amdahl.

When you think about choosing a storage vendor, the smart choice is Amdahl®. Whether you need affordable IBM System/390 mainframe compatible DASD or RAID in an open systems environment. From 10GB to 1TB. Amdahl delivers advanced storage solutions for all your mission-critical data applications. Worth thinking about.

All our storage systems are competitively priced. And you don't have to compromise high capacity or high performance – we're the only storage company offering both in a single compact turn-key system. Maybe it's time you expanded your thinking and options. Call Amdahl.

Amdahl can help you manage all your data storage applications so everyone has access to mission-critical data when they need it. Amdahl. We're your data storage company.

Call us for a no-obligation copy of our new tutorial booklet entitled *Intelligent Data Storage Solutions*.

amdahl®

Leading the way in value-added storage

Call 1-800-223-2215

© 1994 Amdahl Corporation
Amdahl is a registered trademark of Amdahl Corporation. IBM is a registered trademark and System/390 is a trademark of International Business Machines Corporation.

IBM, Novell push integrated network management

By Steve Moore
SANTA CLARA, CALIF.

IBM and Novell, Inc. last week unveiled product modifications that enable NetWare LANs to be mapped and managed from IBM's NetView for AIX network management platform.

At the Enterprise Management Summit here, the companies said the new capabilities are embedded modifications to NetView for AIX and Novell's NetWare Management System (NMS). IBM and Novell officials said users have been pressing them to support management of NetView for AIX and NetWare environments from a single console.

All in one

"The one-console approach will allow users to look at multiple devices without turning around in their swivel chairs," said Bob Janusaitis, a LAN management analyst at the Business Systems Group in Houston. For larger shops, he added, having a common platform for NetView

for AIX and NMS in the control center will likely result in significant savings in both training and administrative costs.

IBM and Novell said users have also been asking for integrated network management functionality. However, some users are content with their current management practices.

"If we had our NetWare servers centrally managed, we might be able to respond quicker to problems," said Ralph Tookey, a senior communications systems programmer at American Cyanamid Co. in Clifton, N.J. But he noted that most of his company's servers run independently with few problems. "If a problem takes half a day to solve but only happens twice a year, nobody worries," he said.

Initially, users will be able to integrate topology, performance and fault-management functions. By the end of the year, NetWare Ethernet traffic informa-

tion will be accessible via NetView for AIX as a result of updates to IBM's Rmonitor for AIX and Novell's Lanalyzer LAN analyzer. Support for Token Ring networks is planned for next year.

Separately, Digital Equipment Corp. said it would release next month a developer's kit for a Windows NT workstation version of Polycenter Manager on NetView. The final product will run on Intel Corp. or Alpha AXP NT servers and use the Windows 95 interface. Windows 95 is Microsoft Corp.'s next version of Windows.

Users at the conference flocked to witness real-time vendor problem-management scenarios.

"No one has done anything like this before, throwing platform vendors into a pit and saying, 'Here are 13 problems. Show the world you can really do end-to-end management,'" said Rick Sturm, the conference program chairman and a

technical staff member at US West, Inc. in Denver.

Each vendor knew in advance the general nature of the problems but not the specifics of the network events generated in real time by the show organizers. Among other things, vendors were called upon to determine the cause of slow network response time, deal with a relational database fragmentation problem and download software to systems in multiple operating system environments.

Users said they liked the vendor management scenarios and the strong user orientation. But the pervasive orientation toward distributed client/server computing was not completely relevant to one mainframe user from a large East Coast insurance company, who requested anonymity.

"I've seen the industry cycle three times between the centralized and distributed paradigms," he said, adding that the centralized approach has served his company well through all those cycles.

Reporter's

Notebook

Advanced Micro Devices (AMD)

says its K5 family of microprocessors will be fully compatible with Windows. "We are ecstatic," a spokesman said after the company tested and booted Microsoft's Windows 95 on its processors last week. AMD has sought to reassure customers and analysts that the K5 will be backward- and forward-compatible with Windows. By next month, AMD plans to distribute alpha samples of the new Pentium-class processors, which will ship in volume in the second half of next year.

Three years after he delivered a keynote address at Comdex, Intel Chairman Andrew Grove looked back at predictions he made in 1991. Among his hits were local bus graphics (Peripheral Component Interconnect), the evolution of color notebooks and electronic messaging (E-mail). Ranked as misses were pen-based wireless notebooks and multimedia

messaging. In between fell Plug and Play technology. As for his visions for the future, software-based, real-time, full-motion videoconferencing and multimedia, multimedia, multimedia.

Separately, while Grove discussed the need for unified standards in the PC industry in his keynote, senior executives at rival AMD said

they will try to establish their own standards. Executives would say only that one of the first specifications could relate to multiprocessing. They said AMD is trying to garner support from industry heavyweights for an alternative to Intel's MPS 1.1 specification for multiprocessors, which AMD claims is not really open.



Dell takes pole position in Pentium race



Ernie Allen (left) of the National Center for Children, and Micrografa's J. Paul Grayson at chili cook-off booth to benefit children. Micrografa sponsored

Digital demonstrated Windows NT clustering capabilities on mixed Alpha AXP and Intel servers. The clustering software—which runs on top of NT and is supposed to ship as a shrink-wrapped software developer's kit—is slated for a late-spring beta, with first customer shipments in late fall. Digital will sell the technology to OEMs and other partners.

Microsoft accused of backing off standard

IBM, Novell say the firm is waffling in support of DMI

By Steve Moore
SANTA CLARA, CALIF.

IBM and Novell, Inc. came out swinging at Microsoft Corp. last week, accusing the software giant of waffling in its support of an emerging standard for desktop management.

In an unusual show of public pique at the Enterprise Management Summit conference here, IBM's director of enterprise management platforms, Lynn Wilczak, said Microsoft was "backing off" its support of the Desktop Management Interface (DMI), a client/server systems management standard being developed by the Desktop Management Task Force (DMTF).

Vic Langford, vice president of Novell's management products division, agreed with Wilczak's assessment.

At issue is whether DMI will provide users with a consistent systems management interface across all major desktop and server operating systems—including Microsoft's Windows 95, the next installment of Windows—or whether Microsoft will support DMI only minimally while pushing its own proprietary approach. That approach is based on its Registry database and plug-and-play interface.

Support is there

DMTF Chairman Shannon Gray-Voigt said other operating system vendors, including SunSoft, Inc., Novell and IBM, all support DMI in its entirety.

Microsoft, however, denies the charg-

es. Rich Barth, product manager for Microsoft's Systems Management Server (SMS), said, "We're not only not backing away from DMI, we're totally behind it." He added that SMS is based on DMTF standards and that Microsoft is incorporating the DMI management interface into the first version of Windows 95.

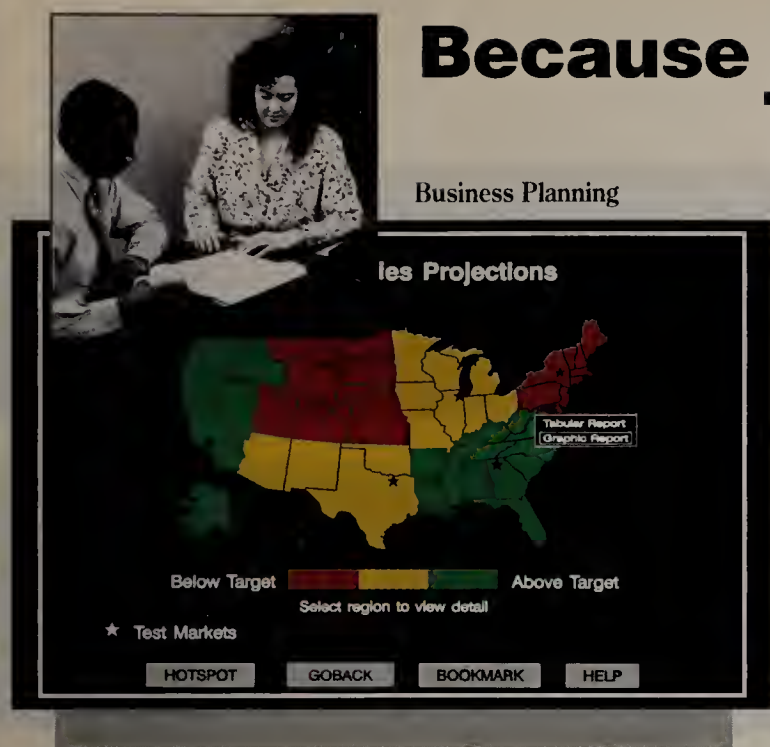
"If Microsoft is less than complete in their implementation of DMI, it would be extremely negative for large user organizations," said James Herman, a vice president at Northeast Consulting Resources in Boston.

Working it out

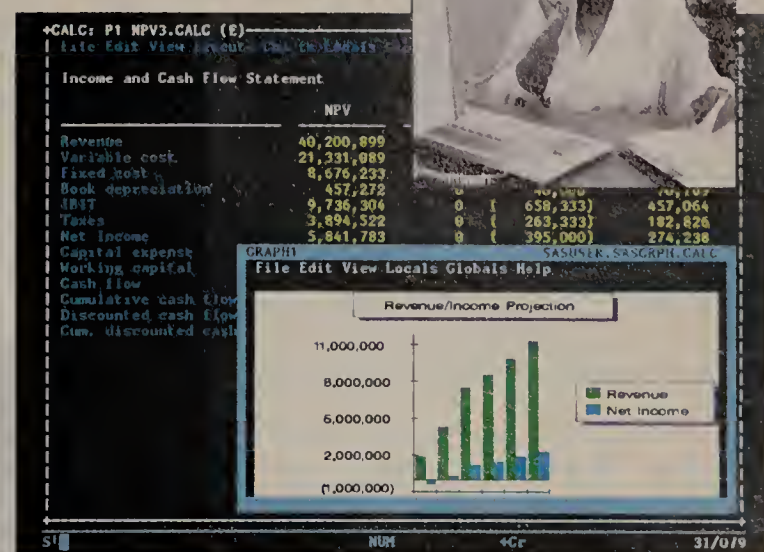
"On platforms where plug and play exists, we are using existing plug-and-play drivers developed by third parties" rather than developing new drivers purely for DMI, Barth said, adding that this will help Microsoft get DMI support to market faster. He said the third-party drivers will provide the same functionality as the DMI component interface, which "is a great solution for platforms that don't have plug and play."

Gray-Voigt said the DMTF intends to work with Microsoft to resolve questions raised about the company's DMI implementation and then "come to the industry by the end of this year with a statement" that will dispel the confusion. Barth said once the DMTF completes its software management information file standards, Microsoft does plan to include DMI instrumentation in future versions of Word, Excel and other applications.

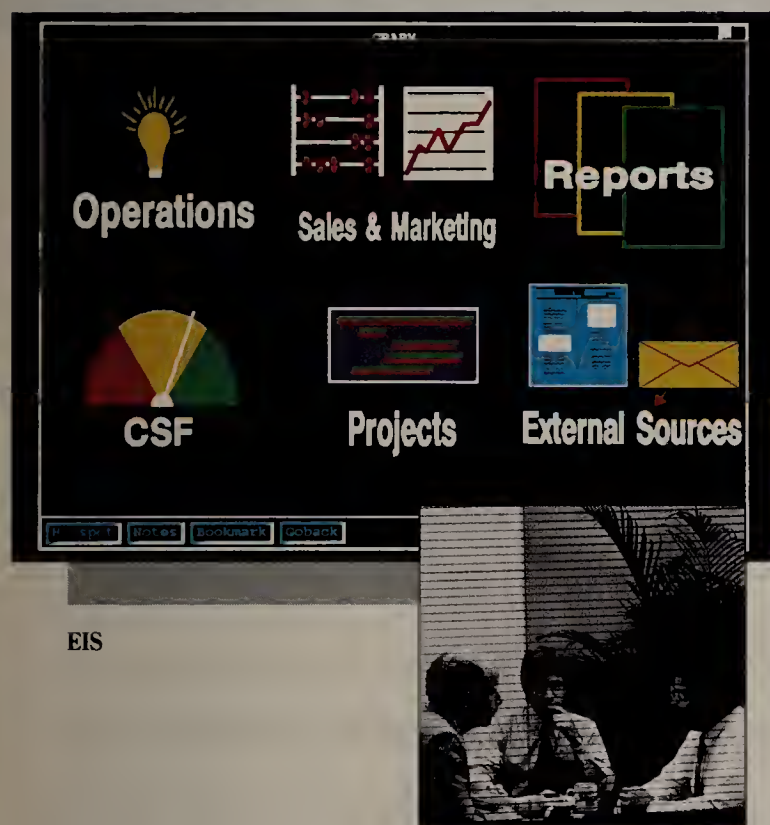
**Because There Are More of Them
Than There Are
of You...**



Financial Analysis/Reporting



The SAS[®] System for Information Delivery



The CEO needs visual checks on all the factors critical to the success of the business. The CFO wants a "small" change in the financial reports. The marketing VP is anxiously awaiting pricing models. And they're *still* waiting for inventory and quality monitoring systems out on the factory floor. How can one IS manager—with so little time, so few resources, and so many budget constraints—meet the diverse needs of so many clients? The answer is the SAS System for Information Delivery.

Integrated Applications for Enterprise-Wide Productivity

Unlike stand-alone solutions—which drain your software budget and drive up training and support costs—the SAS System gives you a cohesive, enterprise-wide application strategy. One that fits the needs of the executive suite, the manufacturing floor, and everywhere in between. One that supports cooperative processing across hardware platforms. And one that responds immediately to new or shifting applications demands. Virtually any application that involves accessing, managing, analyzing, and presenting data is available within the SAS System's information delivery environment.

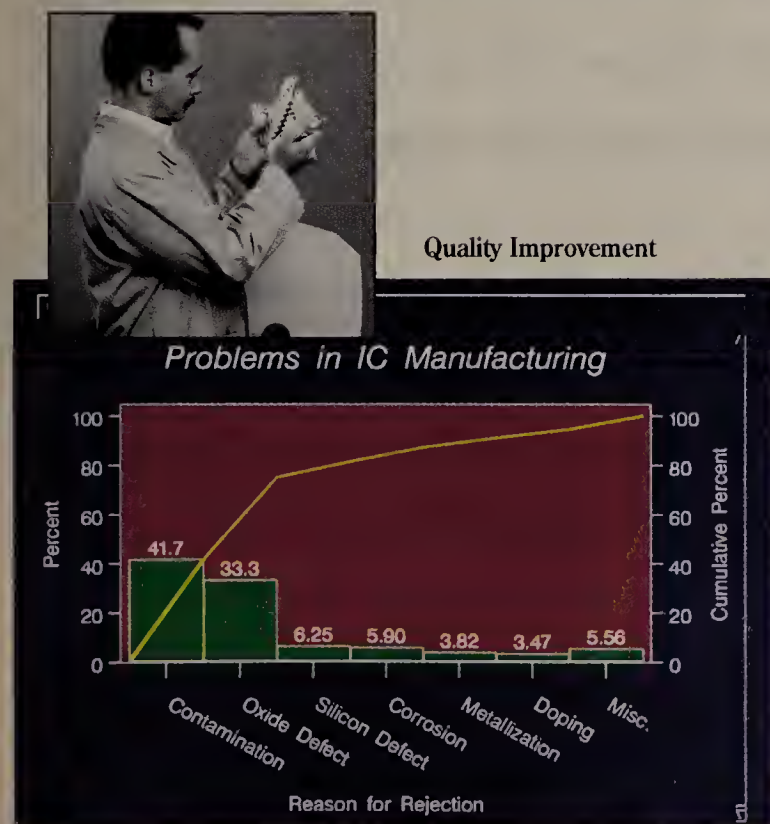
Call Today for a Free Video Preview of the World's Leading Information Delivery System.

See for yourself why the SAS System is the only software you'll ever need. Give us a call at 919-677-8200 for your free video preview. Also ask for details about the free SAS System Executive Briefing...coming soon in your area.



SAS Institute Inc.
Software Sales Division
SAS Campus Drive □ Cary, NC 27513
Phone 919-677-8200 □ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc. Copyright © 1992 by SAS Institute Inc. Printed in the USA.



CONTRARY YOU'VE HEARD, OPEN FOR

Stand clear.

We're about to shatter a large misconception. Digital is not proprietary. Not in our operating systems. Not in our applications. Not in our sales channels. Not in our service and support. And most assuredly, not in our business solutions.

What Digital is, and this may be equally shattering to some, is open. Wide open. You want proof?

Take operating systems. Our version of the UNIX® operating system, DEC OSF/1®, unifies many UNIX versions, like System V, Berkeley and others, so you can run more applications. It's the most open version you can get.

What's more, our OpenVMS™ operating system, choice of millions of users for high-security, high-availability, mission-critical applications, meets the key standard of openness from X/Open™, the nonprofit open standards consortium.

And our support of Windows NT,™ a major component of today's open client/server environment, extends across a more complete product line than anyone else's. Want another example?

Take our leading-edge Alpha microprocessor and PCI peripheral chips. That's exactly what scores of OEMs have done since we began selling them on the open market way back in 1992.

TO WHAT

DIGITAL IS

BUSINESS.

Our StorageWorks™ products are also open, in every sense of the word. And while we have recently sold our heads, disk and tape operations, the business we retain is the size of a Fortune 500 company, providing competitive, technologically advanced storage solutions for multiple computing platforms.

As for software, hang a big “open for business” sign here, too. Starting with LinkWorks™ software, one of the linchpins in our highly advanced group of enabling technologies.

LinkWorks allows people to work in a more effective and cohesive fashion, sharing and editing information, joining together all different kinds of desktops, PCs, workstations, server platforms and databases, creating a veritable “dream team” of open computing.

One last example: Today, the world’s number one provider of multivendor services—that is, the company that does more to help its customers’ systems and applications work together seamlessly, regardless of who sold them—is Digital.

Which brings us back to our headline. We know the only way we’ll keep our doors open is to keep our systems open. Because the alternative to that is one thing we’re just not open to.

For details, call 1-800-DIGITAL or reach us via our Internet address: moreinfo@digital.com.

digital™

Gupta set to jazz up low-key image

By Kim S. Nash

Gupta Corp. is in the throes of a costly midlife crisis. The 10-year-old company is trying to remake itself into a high-volume, high-splash tools mover. But first, it must cast off its image as a quiet vendor that sells application development tools

methodically through a direct sales force.

In the process, Gupta, based in Menlo Park, Calif., has posted \$17.7 million in losses for the past two quarters. Company officials, citing Securities and Exchange Commission rules against making financial predictions, were cagey

about when Gupta will move into the black again.

While no one argues that relentless competition from Powersoft Corp. has forced Gupta to try the makeover, users and analysts were split over whether Sybase, Inc.'s \$940 million acquisition of Powersoft last week puts Gupta in better

stead (see story cover 1).

Although Chief Executive Officer Umang Gupta maintains that the deal "effectively removes Powersoft as a competitor," others do not see it that way.

Steep quarterly losses mean "Gupta was already perceived as being weak," said Aaron Zornes, a senior vice president at Meta Group, Inc. in Burlingame, Calif. "So they've got to be nervous now that Powersoft has Sybase behind it."

Gupta must also overcome the brand identity that Powersoft has nurtured, said Brent Williams, a research director at Gartner Group, Inc. in Stamford, Conn. "When people think client/server, PowerBuilder automatically pops into their minds," he said. To fight those forces, Gupta has gone on a marketing tear since July. For example, Gupta expects to give away nearly 90,000 copies of Solo, a one-user version of its SQLWindows application development tool, by year's end.

Solo gives users only a taste of how the more extensive SQLWindows tool works, which is a good developer training device, said Kevin Barnhill, president of the Florida Gupta Users Group.

Nope, not us

Gupta CEO Umang Gupta declined to comment on the possibility that Oracle Corp. may renew attempts to acquire Gupta after Sybase's merger with Powersoft last week. But Dennis Moore, vice president of tools product marketing at Oracle, said he does not think it will happen. "Gupta is in serious trouble financially," Moore said. "I don't see who would buy them."

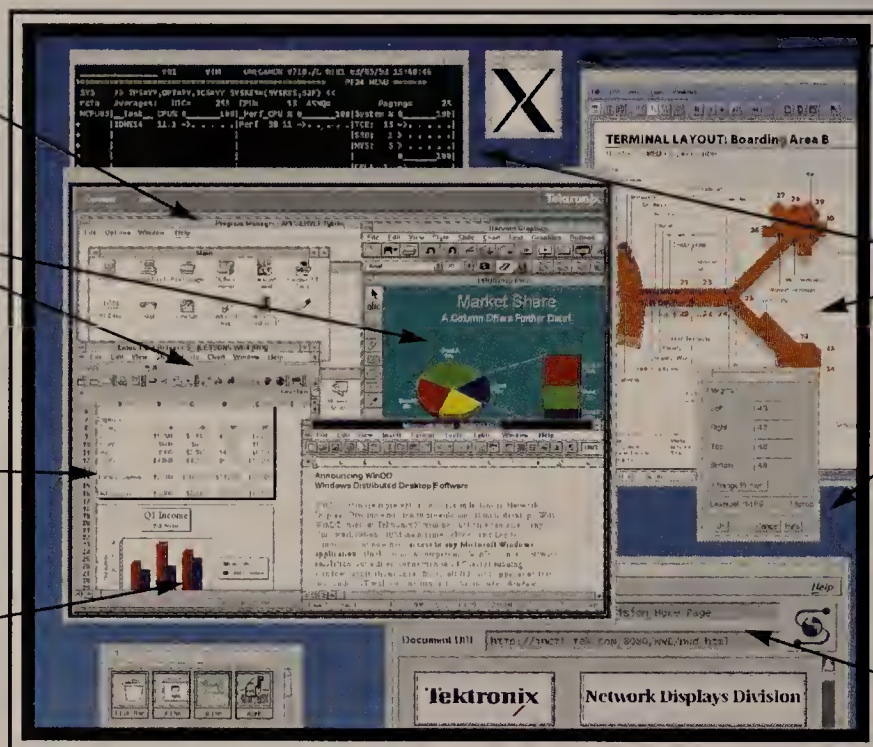
Finally! PC applications for UNIX and legacy systems without the hassle of desktop administration!

Windows' own window manager provides the standard "look and feel" of a PC desktop.

WinDD/Xpress local client displays Windows, NT, or character-based DOS and OS/2 applications running on a PC application server.

Movable and resizable window at standard resolutions (from 640x480 to 1280x1024).

WinDD delivers high performance and low network impact, with CPU-related tasks executed at "native" processor speeds.



WinDD is compatible with all your favorite UNIX window managers, like MOTIF™ and OPEN LOOK™.

Simultaneously open UNIX hosts, IBM® "3270" mainframes, DEC midrange computers, and multimedia environments.

Output to any standard peripheral attached directly to the network or to the WinDD application server.

Full terminal, network, and application performance in every window with true multi-tasking.

No emulation. No porting. No kidding!

WinDD™ software from Tektronix revolutionizes the UNIX desktop! It's the first and only software to deliver multi-user PC applications to the world of open systems. Multiple users now can run native Windows™ and Windows NT™ applications (not emulation) as well as DOS and OS/2 character-based applications with 486-level performance and functionality.

WinDD brings your personal productivity PC software and mission critical DOS applications to your desktop, seamlessly and easily. With simultaneous access your, midrange and mainframe applications, WinDD offers an

extremely cost-effective, scalable solution for today's expanding UNIX networks.

Need more proof?

Call today for your copy of our 16-page Manager's Guide titled, "Uniting Windows, UNIX, and mainframe applications on a single desktop" to learn more about how WinDD blows away the barriers to PC application integration. It will

explain in detail why WinDD represents the most comprehensive PC application access package available. It's free while supplies last.

Call 1-800-547-8949, Dept. 563, for your FREE 16-page guide.

WinDD
Windows Distributed Desktop

Tektronix

Always Anticipating Your Needs

© 1994 Tektronix, Inc. All rights reserved. Printed in U.S.A. TekXpress, WinDD, and WinDD are registered trademarks. Windows and Windows NT are trademarks of Microsoft Corporation. All other trademarks used are the properties of their respective companies. NWD-412

FREE
Managers Guide:
"Uniting Windows, UNIX,
and Mainframe Applications
on a Single Desktop."

24 time zones.
4,300 stores.
55,000 employees.
50 million customers.

And one
extraordinary
company
tracking it all.

*Sprint Technology Helps Achieve
Growth For BLOCKBUSTER.®*

*It takes a company with experience,
vision and commitment to handle the
network requirements of the world's
largest video retailer.*

*That company is Sprint. With Sprint's
Managed Network Service, Blockbuster
Entertainment gets a revolutionary
turn-key solution that combines every-
thing from network design, software and
hardware, to installation and 24-hour-a-
day network monitoring. All working
together using frame relay to link more
than 40 LANs across the country into
one. So when Blockbuster needs up-to-
the-minute information on sales,
distribution or payroll, the answer is
ready and waiting.*

*And, since it's all managed by Sprint, the
network can expand with Blockbuster's
business – without the need to retrain
personnel or change systems.*

*Which leaves Blockbuster free to do
what it does best: Keep the world
entertained.*

*Now, if we can do this for Blockbuster,
imagine what we can do for you. To
find out more about Managed Network
Service and how Sprint can help your
business do more business, call us
today at 1-800-669-4700.*

 **Sprint.**
Business



The place is deserted. The phones hardly ring. Business has never been better.

It's not a flu epidemic. It's a sales force at work. Calling on customers, making sales and money. Instead of being tied to their office, they're free to get out and get busy. All while having instant access to sales figures, inventory, e-mail, or any other network information.

A lot of people talk about extending the network's reach.

One company does it. Only 3Com can help you expand your network to include remote users in any scenario. Be it a sales force, traveling executives, telecommuters, or an entire remote office. 3Com has a complete line of products, including those for ISDN, to make it possible. Simply. And cost-effectively.

Products like the AccessBuilder™ remote access server



allow individual users access to network information as easily as if they were sitting at their desk. Plus, with our EtherLink® III and TokenLink® III PCMCIA adapters, their laptops can be used in the office too.

Meanwhile our NETBuilder® Remote Office family of routers, an integral part of the fault-tolerant SuperStack™ system, allows users at remote sites to remain completely connected to the central office, with little or no need of a network support staff.

What's more, with 3Com's Boundary Routing™ technology and advanced Transcend™ network management, the entire network

can easily be managed from the central office.

3Com's network extension capabilities are only part of our broader range of solutions for high-performance scalable networking. There's simply no better way to build a fast network, catered to any type of user. For more information call 1-800-NET-3Com and receive free *Remote Networking* and *ISDN* white papers.



Oracle delays management tools rollout

By Kim S. Nash

Oracle Corp. missed its summer deadline for the beta version of a set of database management utilities that would let users more easily troubleshoot and correct problems with Oracle 7 systems on a Hewlett-Packard Co. OpenView network.

John Pilat, vice president of Oracle's

HP products division, acknowledged last week that although some integrated utilities were demonstrated at its annual users conference in September, putting out a finished product "is going to take a little longer than we thought."

The goal of the April pact to link Oracle Server Manager to OpenView was to let Oracle users track network activity at

both application and database levels from a single OpenView management console. But Oracle users antsy for such streamlined systems monitoring products will have to wait until the first half of next year for the software, Pilat said.

Indecision at both Oracle and HP about which version of Oracle will support which revision of OpenView has delayed

ship dates by at least six months, Pilat said.

Although Pilat declined to comment on possible technical difficulties in getting the products to work together, the delay came as no surprise to users.

"No kidding it's hard. That's why we've been wanting vendors to get together on this stuff in the first place," said the information systems director at a major food distributor in Tennessee, who requested anonymity.



Get in the fast lane to workgroup document management.

You want a powerful yet easy way to manage your data, *and you want it fast*. Take advantage of our workgroup document management solution to speed you to productivity with:

Fast retrieval. Organize your documents and access them quickly regardless of file formats or storage location.

View and redline. View your document and mark it up without making changes to the original.

Editing. Check out your document and automatically launch the editing application, including *AutoCAD*, *MicroStation*, and *Microsoft Word* and *Excel*.

Expandability. Add additional modules that let you capture your data or build a graphical workflow for your projects.

DM/Librarian for Windows, *DM/View*, and *DM/Redline* — Intergraph's workgroup document management solution.

INTERGRAPH
Solutions for the Technical Desktop

For more information or the number of a salesperson or Business Partner in your area, call 800-345-4856 or 1-205-730-5499.

Intergraph and the Intergraph logo are registered trademarks and Solutions for the Technical Desktop, DM/Librarian, DM/Redline, and DM/View are trademarks of Intergraph Corporation. MicroStation is a registered trademark of Bentley Systems Inc., an Intergraph affiliate. Other brands and product names are trademarks of their respective owners. Copyright 1994 Intergraph Corporation, Huntsville, AL 35894-0001. DDAD200A0

Who's on first?

A sampling of initiatives between database makers and network or systems management companies

COMPANY	PROMISE
CA-Ingres	Build Ingres interfaces into CA-Unicenter
Oracle	Allow monitoring of Oracle 7 from a single HP OpenView console
Sybase SQL Server	Build a shell to run on top of Tivoli's Management Environment to track network events that affect SQL Server performance

The first half of next year is also Oracle's target to ship Version 7.2 of its flagship database. An incremental 7.1 release expected before March "probably will contain beta" versions of the planned OpenView features, Pilat said.

Direct line

Third-party companies such as BMC Software, Inc. and Compuware Corp. offer management products that run on OpenView and view the Oracle 7 database. But some users said they would prefer to get that functionality directly from Oracle.

"You just know it's a lot more integrated when it comes to the more complex database features, like stored procedures," which every database does differently, said Kevin Loney, a corporate database administrator at Astra/Merck, a Wayne, Pa., joint venture partly owned by pharmaceutical firm Merck & Co.

In the meantime, Astra/Merck has resorted to rolling its own OpenView-to-Oracle systems management as specific functions are needed, Loney said. Even so, the firm's busy IS staff lacks the time "to do systems management thoroughly," he said.

Loney said that in an ideal world, he would have a utility that would tell him via a beeper message whether a given database was up or down and then automatically take action according to a set of predefined conditions and "if/then" statements.

"The whole point of having systems management is to establish control and beyond that control, take an action," Loney said. "We don't have that now."

After Oracle gets the product out the door, it plans to add more sophisticated OpenView integration, Pilat said. For example, Oracle has designs on melding database administration features with OpenView's core operations center.

Vendor scalability goals outstrip need. See page 57.



The COMPUTERWORLD Comedy Store

"Oops - I forgot to log off again."

One-size fits all. 50/50 blend, cotton/polyester. Made in U.S.A.

T-shirt ... ~~\$15.99~~
Sweatshirt ... ~~\$24.99~~

Now only
\$7.99

**Sale
50%
Off!***

"What's the digital bathroom scale doing in my laptop case?"

32 oz. Sip-it Bottle with insulator ... ~~\$7.99~~

Now only
\$3.99

Now only
\$12.49

"Don't panic! Just push the escape key."

White ceramic 10 oz. mug ... **\$7.99**

"What's the digital bathroom scale doing in my laptop case?"

Roomy 100% natural cotton canvas with webbed straps, 14" x 9" ... ~~\$12.99~~

Now only
\$6.49

Now only
\$8.49

"Don't panic! Just push the escape key."

Durable and roomy, 16" x 9" black cotton canvas duffle bag - includes sturdy webbed straps and zipper. Made in U.S.A. ... ~~\$16.99~~

"There! There! I swear, it just moved again!"

Mousepad, 8" x 7 1/2" ... **\$7.99**

*selected items only

The COMPUTERWORLD Comedy Store To order: Fax 508-626-8258 or Call 1-800-222-7545.

Item	Price	Quantity	Amount
C1AD3 Mug	\$7.99		
C2AD3 Sip-it	\$3.99		
C3AD3 Mousepad	\$7.99		
C4AD3 T-shirt	\$7.99		
C5AD3 Sweatshirt	\$12.49		
C6AD3 Duffle	\$8.49		
C7AD3 Tote Bag	\$6.49		
Shipping & Handling			
AVOID DELAY! Please include Shipping & Handling. If your merchandise subtotal is:			
UP TO \$10.00	\$2.50	Subtotal	
\$10.01 - \$20.00	\$3.95	Shipping & Handling*	
\$20.01 - \$35.00	\$4.95		
\$35.01 - \$50.00	\$6.95	Sales Tax**	
\$50.01 - \$100.00	\$9.95		
OVER \$100.00	\$13.95	Total	

* For Canada and International orders, please add \$5.00 per item for Shipping and Handling.

MAIL TO: **COMPUTERWORLD**
P.O.Box 9171
Framingham, MA 01701 U.S.A.
Attn: Product Fulfillment
(Monday - Friday 8:30-5:30 EST)

SHIP TO:

Name

Company

Address (Please use street address; UPS does not deliver to P.O. Box)

City

State/Province

Zip/Postal Code

Country

()

Method of Payment (in U.S. dollars only)

Check or Money order payable to: **COMPUTERWORLD**

☐ VISA ☐ MC ☐ AMEX

Card No.

Exp. Date

Signature

Your credit card will not be charged until your items are shipped.

Thank you for your order!

COMPUTERWORLD

The Newspaper of IS

** Residents of MA, CA, NJ, GA and DC, add applicable sales tax. Canada residents add G.S.T. Daytime Phone

THE NEW COMPAQ LTE ELITE. ALL THE FEATURES YOU ASKED FOR. FROM THE DIFFICULT~

At Compaq, we always try to give you the notebook features you've asked for. Even if your requests do seem to stretch the laws of physics. Case in point: the Compaq LTE Elite.

To begin with, we actually found a way to get rid of that bulky AC adapter that you've always had to carry. We built the LTE Elite to have its own built-in AC adapter, so when you travel, all you need is a thin power cord.

At your request, we also designed it to be easily expanded. The LTE Elite gives you a choice of fast 486 processors (up to 75MHz) and a removable hard disk. It also has PCMCIA slots that let you use over 140 Compaq-tested cards. And almost every key component is **upgradeable**: the memory, the display and the processor itself.

We even designed the LTE Elite to make things easier in the office – with the SmartStation and MiniStation expansion bases. Both of these

options feature built-in networking* and SCSI-2 capabilities for an instant desktop configuration – complete with ports for your full-sized monitor and keyboard. The SmartStation also adds expansion slots and bays, a spare battery charger and motorized docking.



Of course, the LTE Elite also provides the peace of mind that comes with the Compaq three-year warranty** and free 24-hour helpline.

You can try the LTE Elite for yourself at a nearby authorized Compaq reseller. Or, if you would prefer receiving specifications immediately via fax, just give us a call at 1-800-345-1518, choose the PaqFax option and select document #4023.

With the LTE Elite, you'll find it's hard to make a wrong decision. If not impossible.

COMPAQ



~ TO THE IMPOSSIBLE.



Internet providers step up offerings

By Ellis Booker

Internet access providers are sprouting up faster than pot plants in a college dorm.

To keep pace with an accelerating interest in the Internet among corporations and individuals, a roiling industry has emerged. The number of companies selling Internet connectivity doubled in the past year to more than 200.

The stiffer competition has, in turn, sparked appealing discounts. But analysts warn of an inevitable shakeout, so pick your provider prudently. While today's market for commercial Internet access services is worth roughly \$100 million, it is projected to swell to \$1 billion by the end of 1996.

A varied clientele

The new players range from well-established firms with European satellite offices to regional providers to "home brew" access providers. This third category is more difficult to track "than pot patches in Daniel Boone National Forest," said Garrett N. Ray, an Internet consultant in Newton, Mass.

As commercial customers begin examining the various options springing up around them, industry observers said they are looking for stable, professionally run businesses rather than discounts. Accord-

ing to Jay Batson, a senior analyst in the network strategy service at Forrester Research, Inc. in Cambridge, Mass., users are also asking some key questions such as, "Can I trust this company? Will it be around long term? Do they have a seven [day] by 24 [hour] operation? Do they understand my business?"

This caution is echoed by Alan Taffel, vice president of marketing at UUNET Technologies, Inc. in Falls Church, Va., one of the country's first commercial access providers. "It'll soon become apparent to the business market that not all [access providers] are created equal," Taffel said.

While somewhat self-serving, Taffel's advice is well taken. Once a company evolves from seeing the Internet as an exploratory wonderland to a business frontier, it will want a guaranteed level of service and technical representatives available over weekends.

Founded in 1987, UUNET claims about 3,500 customers, many of whom are business sites linked with dedicated 56K bit/sec. lines over UUNET's 45M bit/sec. backbone. Those shopping for a provider need to ask about service guarantees and support policies, Taffel recommended.

Batson, for one, said he predicts "a huge shakeout" in the access provider arena and cited one causal event: The end of public funding for the Internet's backbone, the

NSFnet, in April of next year.

Most at risk, Batson said, are regional providers such as BARRnet in Stanford, Calif., and SURFnet in San Diego, which historically served as regional hubs at the end point of the expensive, high-capacity lines of the National Science Foundation's NSFnet backbone. "Either they'll have to become a national or be bought out by a national," he said. "When the free backbone goes away, their profit margin shrinks away."

Market on the move

Still, most observers think the market for individual accounts — generally offering slower speed dial-up connections — will continue to be crowded, dynamic and confusing for a while.

One differentiator at this level may be Integrated Services Digital Network (ISDN) support. More than a few Internet watchers think ISDN will revolutionize the dial-up side of the market and make graphical browsers for the Internet such as Mosaic more than a sluggish novelty for dial-up callers.

UUNET, for instance, says its nationwide ISDN service early next year calls for pricing 64K bit/sec. access at around what it sells 14.4K bit/sec. access for today.

County adopts Internet system. See page 57.

Pdialing in

How do you find an Internet access provider in your neighborhood?

Try Pdial, a public service list of worldwide Internet access providers. The list was compiled by Peter Kaminski, who now works at San Jose, Calif.-based Internet provider Netcom Online Communications Services, Inc.

The first version of Pdial was released about 2½ years ago, and Kaminski plans an updated list in December.

Pdial is available the following two ways:

- Anonymous file transfer protocol at <ftp://netcom.com/pub/info-deli/public-access/pdial>
- Electronic mail by sending a message to info-deli-server@netcom.com and put the words "send pdial" in either the subject field or body of the message.

Fault-tolerant systems

Sequoia reneges on deal with Digital

By Mary Brandel

Following two months of negotiations, Sequoia Systems, Inc. has decided not to buy Digital Equipment Corp.'s fault-tolerant business.

But Sequoia, a \$44 million manufacturer of Unix-based fault-tolerant systems, has signed other deals intended to ex-

pand its business, including the following:

- With Toshiba Corp., it is developing a PowerPC-based fault-tolerant system, which is slated to be available in late 1996.
- It is supplying fault-tolerant technology for a future version of Novell, Inc.'s UnixWare operating system.

It just signed a definitive agreement to merge with Texas Microsystems, Inc. in an all-stock transaction. The Houston-based firm makes systems designed for harsh industrial and commercial environments, such as ruggedized PCs for the petrochemical and steel industries.

"Because fault tolerance has always been a niche type of market, they have to be able to broaden the scope of customers that they can sell to," said Steve Josselyn, an analyst at International Data Corp. (IDC) in Framingham, Mass. Sequoia currently owns just 1.5% of the fault-tolerant arena.

Double the money

The Texas Microsystems merger gives Sequoia a low-end to midrange suite of fault-tolerant computer offerings, according to Larry Lenihan, an associate at Broadview Associates in Fort Lee, N.J., which advised Sequoia in the merger.

The merger will also double Sequoia's revenue this year, bringing it to \$90 million. However, Sequoia is still quite a bit smaller than competitors Stratus Computer, Inc. and Tandem Computer Co., which post revenue of \$513.7 million and \$2.1 billion, respectively.

But with \$18.9 million in cash and

Back in the black

Sequoia may have stemmed its revenue slide with increased year-over-year revenue in 1994

REVENUE	1992	\$62.6M
	1993	\$41M
	1994	\$44.8M
PROFIT/LOSS	1992	-\$3.9M
	1993	-\$31M
	1994	\$8.6M

Getting out while the getting's good

With its fault-tolerant business left standing at the altar, Digital last week said it will exit that market rather than seek another suitor.

The company will deliver an "end of life plan" for the tiny installed base of VAXft customers. At the end of 1993, there were just 600 VAXft systems installed, accounting for \$15 million in revenue, according to IDC.

Customers will be advised to either move to Alpha AXP-based clustered systems or seek alternative fault-tolerant technology outside Digital. Plans for an Alpha AXP-based Unix fault-tolerant system have also been scrapped.

"I don't think it would be a big sur-

prise" to customers, said Steve Josselyn, an analyst at IDC. "Over the past two years, Digital has not been real active about [fault-tolerant] development."

In August, Sequoia signed a memorandum of understanding to purchase Digital's Unix-based fault-tolerance technology. However, a Sequoia spokesman last week said "a whole slew of items" such as development schedules, royalties and warranties led to the deal's cancellation.

Part of the problem, he confirmed, was that the resources required to complete the system did not match the expected revenue under Digital's suggested joint-marketing plan.

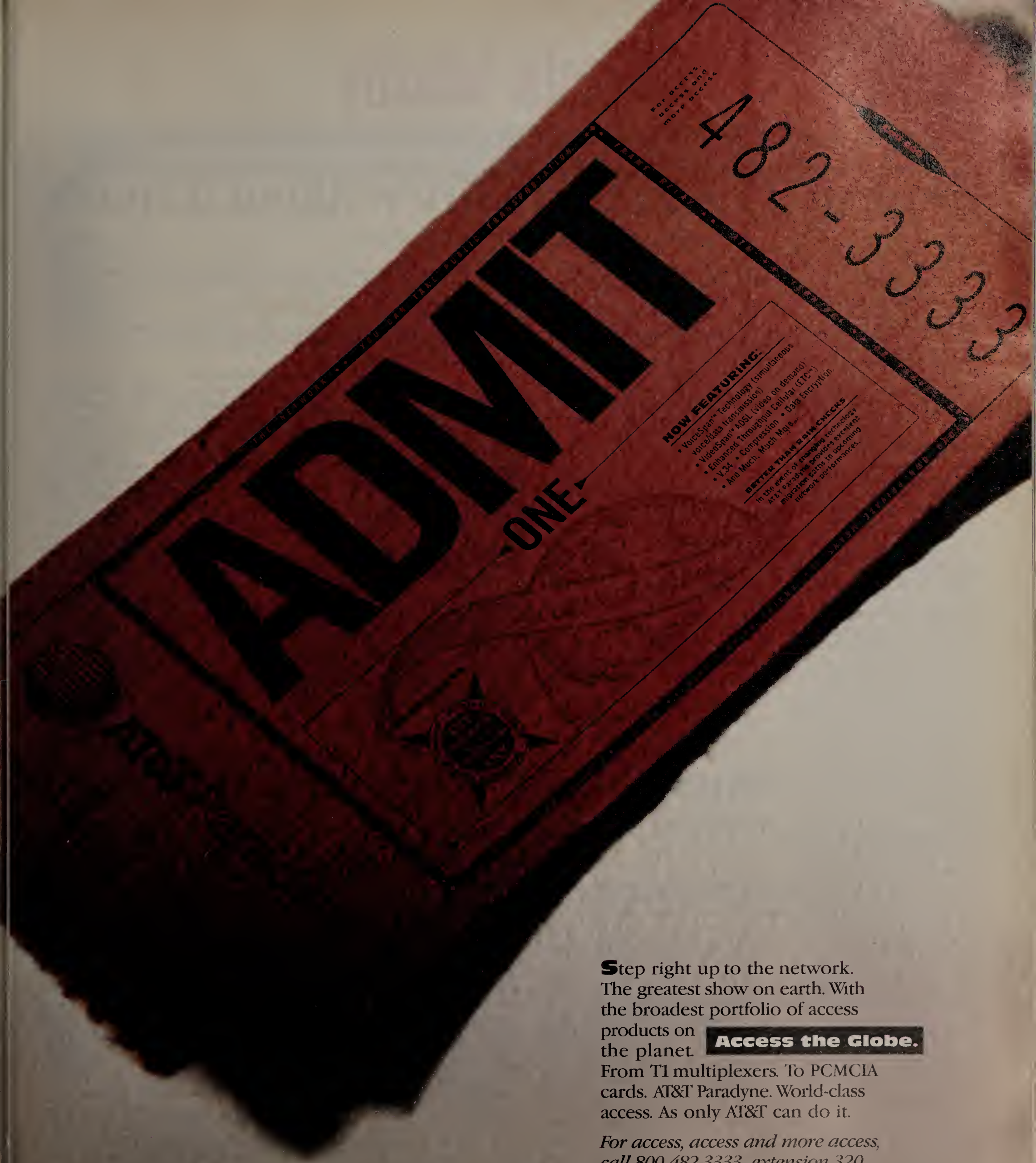
—Mary Brandel

equivalents, Sequoia sees fiscal 1995 as a "year of investment," according to Dick Goldman, chief financial officer. Research and development expenditures are slated to be a fairly hefty 18% to 20% of sales.

This stands in contrast to the previous three years at Sequoia, which were marked by strict cost controls. After restating its financials in 1991 and 1992, the Securities and Exchange Commission launched an investigation. And between 1992 and 1993, the company lost \$35 million, including a restructuring charge.

In fiscal 1994, cost cutting resulted in Sequoia's first profit since 1991, at \$8.6 million. It also increased revenue by 9% (see chart) since 1993.

"It looks as though they've started to turn a corner," Josselyn said.



Step right up to the network.
The greatest show on earth. With
the broadest portfolio of access
products on
the planet.

Access the Globe.

From T1 multiplexers. To PCMCIA
cards. AT&T Paradyne. World-class
access. As only AT&T can do it.

*For access, access and more access,
call 800 482-3333, extension 320.*

ISO 9001
CERTIFIED



AT&T Paradyne

Briefs

IBM, Seagate settle

IBM settled its trade secret lawsuit against **Seagate Technology, Inc.** filed with the U.S. District Court in St. Paul, Minn. The terms of the settlement are confidential. According to Seagate, the case involved an ex-IBM employee who joined Seagate's magneto-resistive heads operation.

Oracle's Miner dies

Oracle Corp. co-founder Robert Miner died Nov. 11 of cancer. Miner, 52, led the development of Oracle's flagship database from 1977 until 1992, when he took charge of a small advanced technology group at the company.

Digital lifts freeze

Digital Equipment Corp. lifted its six-month salary freeze early this month. Chief Executive Officer Robert Palmer had promised to do so if the second quarter, ending in December, were profitable. While profitability is not a "certainty," Palmer told employees in a taped presentation that he expects the company to at least break even.

KnowledgeWare slips

KnowledgeWare, Inc. last week reported a loss of \$15.8 million for its first quarter of fiscal 1995 compared with a profit of \$1.4 million for the same period last year. Sales were \$21.8 million, down from \$33.2 million in the first quarter of 1994. The results included \$6.2 million in operations restructuring charges in July. The quarter ended Sept. 30.

Canion group merges

Rod Canion, co-founder and CEO of **Compaq Computer Corp.** and founder of **Insource Management Group**, has merged Insource with Avant, a Calgary, Alberta, information systems company. The result is **Insource Technology Corp.**, which will promote the Open Systems Software Factory method.

Can't start a fire without a spark

Start-up Wildfire pins hopes on digital secretary

By Michael Fitzgerald
LEXINGTON, MASS.

Wildfire Communications, Inc., a telecommunications software maker founded in 1992, has 23 employees, one Asteroids arcade game and two dogs.

The arcade game gives the engineers a way to vent their aggressions, and the dogs have been key to helping staff stay calm amid intense pressure, says co-founder Bill Warner, only half-kidding.

Warner is an Apollo Computer alumnus who went on to co-found Avid Technology, Inc., a red-hot digital editing company in Tewksbury, Mass., whose systems have been used to edit movies such as *True Lies*. Warner's idea for Wildfire came while he was at Avid, easting about for an idea for a low-end voice product. At about that time, he got a cellular phone.

"No one knows where you are and how to get to you, and you may not know your [cellular] phone number," Warner said. Having read an article in which CNN founder Ted Turner said "don't bother setting small goals," Warner said he "decided to make the most popular software ever made."

Warner's product, Wildfire, would be a sort of digital secretary that handles all of a user's incoming and outgoing phone

calls, whether he is at his desk or a pay phone [CW, Oct. 10]. Warner's hope was that the product's popularity would spread, of course, like wildfire.

The flammability of the market will soon be tested, as Warner and co-founder Nicholas D'Arbeloff near shipment of their first product.

Andrew Mareuvitz, a general partner at



Wildfire Communications' Bill Warner keeps a calming influence close at hand

Boston venture capitalist Matrix Partners, was Wildfire's first investor. He said he bought into the concept because "I see this as a stage in the evolution of computing... to where computers disappear altogether." The Wildfire device, which is based on an Intel Corp. Pentium-based server, is a small step in this direction, he said.

Quite a nickel

Still, it may be some time before people start putting their Wildfire numbers on business cards: The product is pricey, at \$40,000 to \$70,000 for a department.

Warner and Mareuvitz said in separate interviews that the company must bring down prices and decide whether their next product will be a high-end, high-cost machine targeting cellular carriers and regional Bell operating companies or a low-end, consumer-oriented device.

Technology may help make the choice because Wildfire uses voice recognition and telecommunications add-in boards, both of which are on a diving cost curve.

The software must also evolve. Robert Womaek, director of computer services at Wildfire beta site Hale and Dorr, a large Boston law firm, said he is looking seriously at buying a Wildfire system but wants assurances that a solid billing component will be added in timely fashion.

Warner said billing will be built into the next version.

D&B Software thinks big in reorganization

Mainframe products to get their own division

By Rosemary Cafasso

The last word most client/server software companies will speak these days is mainframe.

But mainframes were a topic of choice last week for Douglas MacIntyre, the new chief at Dun & Bradstreet Software.

MacIntyre confirmed that the \$400 million Atlanta company — one of the first mainframe software firms to make a big push for client/server — is reorganizing to re-emphasize its mainframe business and make it an equal but separate business unit alongside its client/server effort.

D&B Software has previously functioned as one software concern, developing, selling and supporting mainframe and client/server software. That meant the sales force and support staff were responsible for two very different product lines, an arrangement that sometimes resulted in a muddled message.

Now, mainframe customers will deal with dedicated mainframe staffers, and client/server users will work only with members of the SmartStream division.

"We spent a lot of energy working on cli-

ent/server solutions," MacIntyre said. "There's probably been more attention given to client/server, so what we are doing is creating a division dedicated to the mainframe customer base." Company officials said they hope this change will not only provide the old line customer base with better service but will enable the new client/server business to react more sharply to competition.

"If I were a mainframe customer, I would be more comfortable," said Clare Gillan, an analyst at International Data Corp. in Framingham, Mass. "It does make more sense. The objectives of the dedicated groups will be different."

D&B Software does not release mainframe-only revenue, but the company has a customer base of close to 10,000.

"We are still totally mainframe," said Susan Veal, manager of financial accounting systems at First Colony Life Insurance Co. in Lynnhburg, Va. "We do have [client/server] plans for the future, but it is probably

not feasible for at least two or three years. I think D&B is finding this with a lot of clients. We were told that they were going to start focusing again on the mainframe."

"This is excellent," said Bobby Cameron, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

"Essentially, the mainframe business is support and maintenance. That's a no-brainer. It's in the \$200 million range" in revenue, Cameron added. "In the client/server world, this is new stuff where they are truly entrepreneurial. They have to be aggressive in the market, with a whole new set of skills."

MacIntyre stepped in as chief executive this summer when previous D&B Software President Hank Holland resigned. The change came at a time when D&B Software had

fallen well behind rivals SAP America, Inc. and Oracle Corp. in the client/server market. While SAP and Oracle claim to have client/server customer bases in the 2,000 range, D&B Software has about 530 customers in that area.



D&B Software's Douglas MacIntyre seeks to better serve mainframe users

Data Warehousing with Informix Dynamic Scalable Architecture

- | | |
|--|--|
| ✓ Parallel data query | ✓ Static database partitioning |
| ✓ Dynamic system administration | ✓ High availability |
| ✓ Parallel loading and indexing of data | ✓ Open systems standards |
| ✓ Support for symmetric multiprocessor, loosely coupled, and massively parallel hardware | ✓ Large selection of data access tools |

Call For A Free
Data Warehousing Info Kit.

Data Warehousing: The True Test of a Parallel Database.

Recently, Informix Software introduced Dynamic Scalable Architecture™, a next-generation database architecture designed to move hundreds-plus gigabyte databases from mainframes to client/server environments.

DSA is a high-performance, multithreaded, parallel database architecture, addressing the growing needs of managing larger, more complex business-critical databases. Because of its core internal parallelism, DSA can handle the strenuous demands of very large databases—and the new classes of open systems applications they enable. Like data warehousing.

META Group, February 1994 Client Survey

“More than 90 percent of our Fortune 2000 clients indicate they will be pursuing a data warehouse strategy in the next three years.”

Why is data warehousing a key technology for dynamic organizations? Quite simply, it's the easiest way to get information into the hands of people who need it—without disturbing production data while they use it.

Data warehousing has traditionally been done on the mainframe, where large amounts of data can easily be stored and manipulated. But with DSA, you can move the data off the mainframe and into an open systems environment. And because DSA is a parallel server, it employs a divide-and-conquer approach: identifying database tasks that can be performed in parallel and executing them in parallel—avoiding system bottlenecks.

W.H. Inmon, “Building the Data Warehouse”

“In the data warehouse environment, the question is not whether...data will be partitioned but how...data will be partitioned.”

Partitioned data allows users to do parallel sorts, scans, joins, loads/unloads, back ups, and restores faster and easier—all critical functions in a data warehouse environment.

Informix's Dynamic Scalable Architecture will run on the entire range of new, high-performance open systems, from uniprocessors to symmetric multiprocessors, loosely coupled clusters, and massively parallel machines.

Find Out More About Data Warehousing and DSA.

We'd like to send you a special data warehousing information kit. **Send or call toll-free 1-800-688-IFMX, ext. 33 for your free kit.**





Back in the 15th century, this was a generally accepted view of Hell. Today, of course, we can see how inaccurate it really is. Not one person, for instance, is shown trying to manage a corporation's distributed systems. You can probably forgive the artist for this oversight. But you may be wondering when someone will deliver the management software that can help you take care of this mess. At Legent, being that someone is what we're all about. And so far, our efforts have resulted in the most extensive set of industrial-strength, distributed systems management tools available. We've also developed an open architecture called XPE™ that we think is pretty remarkable (some of the toughest analysts in the industry tend to agree). XPE lets our software work together across almost anything you can wire together, regardless of function or platform, from mainframes to UNIX workstations to PC LANs. Which means you can manage your distributed systems from the platform of your choice, something our customers tell us has definitely made their lives easier. Is it Paradise? No, not yet. But we can promise you one thing: It's a lot better than where you are right now.

For more information about Legent products and strategies, call 1 800 676-5468 extension 2500. We'll fax you a technical overview the same business day.

Editorial

Trial and error

Now this, from the front page of *USA Today* last Tuesday: "In cyberspace, where surfing and flaming take place with Wild West abandon, a new word threatens to tame the exuberance: lawyering."

The same day, there were numerous reports about Bill Gates' presentation on Microsoft's proposed on-line network (which no doubt will be "cool"). In his announcement, Gates was forced to address the legal battle he will inevitably fight to launch the service.

It's very likely the legal eagles are going to cite the on-line network proposal, along with Microsoft's previously announced intention to purchase Intuit, as further proof of the monopolistic activities of the Evil Empire of the Northwest.

It could be said that we should be thankful for the legal community's efforts to protect us from the unholy terror of competition. But we won't say that here.

Instead, let's reflect a bit on the realities of the information technology marketplace and how these realities continue to render the assaults on competition impotent, though no less lucrative for lawyers.

There is no such thing as a competitive advantage that is any more lasting or sustainable than the beautifully colored autumn leaves. One vendor's advantages all blow away in due time. New growth returns only if the corporate tree has been properly cared for and nourished.

In the case of Microsoft, the company's future depends to a great extent on its ability to eclipse its 16-bit Windows product with a 32-bit operating system that sustains its customers' software investments and doesn't produce high retraining costs. If Microsoft fails, then power shifts to IBM's OS/2 and to Unix as well. It's really that simple.

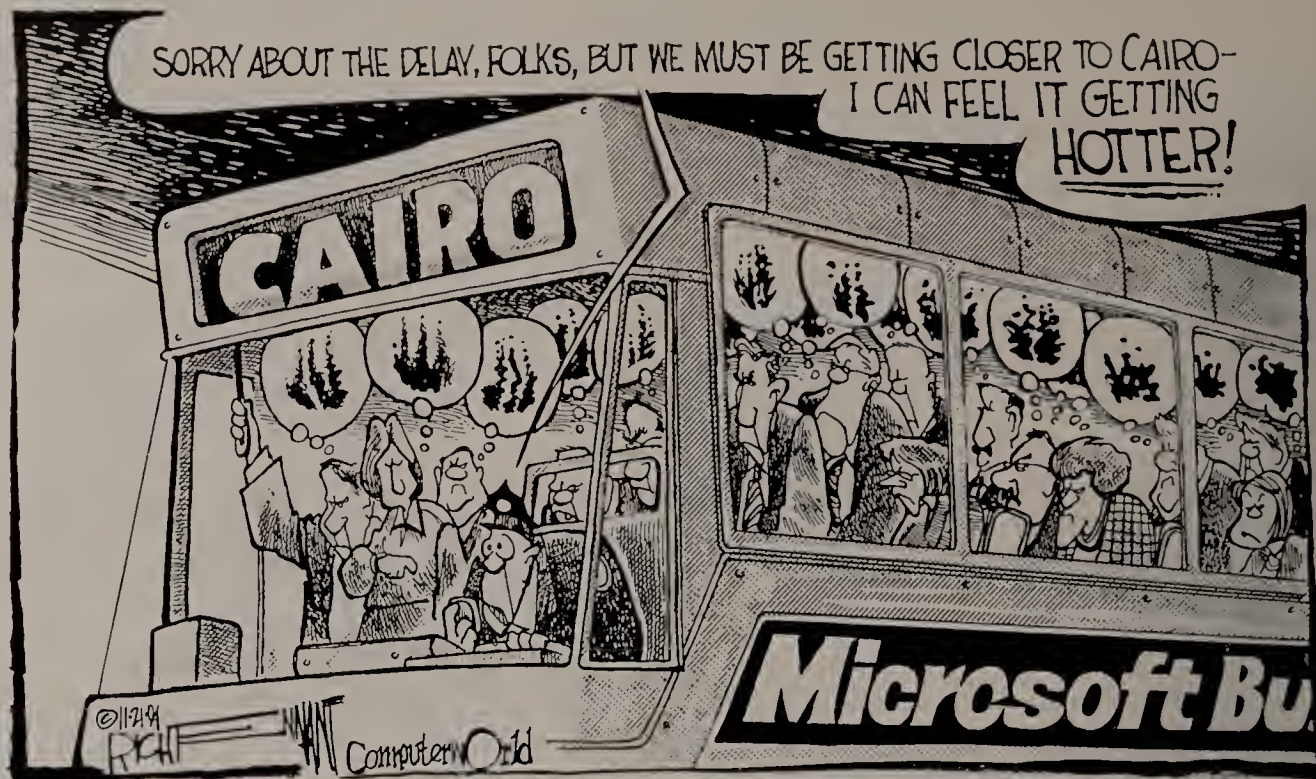
Think of IBM's "monopoly" on large systems, wherein it owned 70% of the worldwide market for mainframes and about 90% of the operating system market when the government launched a fruitless, 12-year antitrust battle with the company in 1969. IBM's mainframe market share numbers today are still about the same, give or take a bit. But what happened to the market? Why is no one clamoring about antitrust measures against Big Blue?

Because the market changed radically, and all the king's horses and all the king's men could do nothing to stem the market forces of customer demand. Though still critical to corporate-style computing, mainframes account for a fraction of total systems spending.

Look at General Electric, which is led by Jack Welch, a tenacious CEO who demands that GE be No. 1 or No. 2 in every market in which it competes. Along the way, its shareholders — and, most importantly, its customers — benefit tremendously. The computer industry shouldn't be held to some separate values that would make striving to be the best, to be No. 1, anything less than what it is: good for customers.

Bill Laberis

Bill Laberis, Editor in Chief
Internet: blaberis@cw.com



Letters to the editor

Objective-C could be a contender

"Object developers should think Small" [CW, Nov. 7] leaves out Objective-C as a contender for the top ranks of object-oriented languages.

Objective-C has many of the advantages claimed for Smalltalk: inheritance, polymorphism and a dynamic runtime system. Programmers familiar with Smalltalk would have little trouble moving to Objective-C and vice versa.

Objective-C differs from Smalltalk in not always providing access to all the source code and, in current incarnations, not being object-oriented from top to bottom. But that's for another debate. Several major client/server players have implicitly committed to Objective-C as the underpinning of their object-based systems. OpenStep, pioneered by Next Computer, has been endorsed by Sun Microsystems, Hewlett-Packard and Digital. Recent rumblings of OpenStep on Windows NT would only further endorse Objective-C as a contender.

Henry McGilton
Trilithon Software
Los Altos, Calif.

Responses to 'Gays at home' draw fire

It seems that what prompted objections from a few readers to "Gays at home in high tech" [CW, Sept. 26] was not the personnel aspect of the story but the people covered. Those same readers weren't bothered by earlier arti-

cles about upward mobility, job recognition, glass ceilings, etc., with respect to women, blacks, Asians, non-English-speaking programmers, etc. Apparently, what annoyed some readers was not the article itself but what was inside it: the news that employers are starting to treat gays and lesbians fairly.

Any reader who objects to the article only because it covers a specific social group doesn't understand that the principles of tolerance, fairness and liberty are supposed to be for everyone. Even if some readers didn't like the news, the story was legitimate, and your coverage is applauded.

Ned Flaherty
Boston

I strongly disagree with reader Harry Krabbe, who wrote "I'm sure gays have their social clubs to support their deviant lifestyle, but I don't care to read about it in a publication I'm paying for" [Letters to the editor, Oct. 31]. That attitude exemplifies why such articles need to be published. Discrimination or social ostracism of any computer professionals for whatever reason warrants coverage in *Computerworld*.

Putting blinders on may make Mr. Krabbe feel more comfortable, but that will not change the truth: that a significant fraction of the people we all live and work with has a sexual orientation different from our own.

As far as my subscription goes, I'm willing to extend it for a year to make up for Mr. Krabbe's cancellation. I, for one, am not afraid to read the truth in your excellent publication.

Markus Pelt-Layman
Longmont, Colo.

A bit in error

You should be a little more careful in checking bits vs. bytes. In the Oct. 31 issue, you made the same mistake twice — in "Computers second on list for speedy interface" and in Inside Lines. Proposed standard 1394, called FireWire by Apple, operates at 100M, 200M or 400M bit/sec. The other interfaces listed in the table, however, are all measured in M bytes per second. Using the same units for both makes the comparison entirely different.

FireWire has a lot of technical advantages over SCSI or SCSI-2, including lower cabling costs and ease of installation, but it does not have a speed advantage until you get to 200M bit/sec. or higher. Also, SCSI-3 products will be available next year running at 1.06G bit/sec.

David B. Tuttle
Chief Engineer
Augment Systems, Inc.
Bedford, Mass.



■ Computerworld welcomes comments from its readers. Letters may be edited and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

COMPUTERWORLD

Editor in Chief

Bill Laberis

Editor

Paul Gillin

News Editor

Maryfran Johnson

Sections Editor

James Connolly

Assistant News Editor

Patricia Keefe

Assistant Sections Editor

Johanna Ambrosio

Technical Editor

Charles Babcock

Senior Editors

Craig Stedman

Large Systems

Ed Scannell, PC Software

Michael Fitzgerald

Mobile Computing

Rosemary Cafasso

Client/Server Software

William Brandel, PC Software

Mid-Atlantic Bureau

Thomas Hoffman

User Strategies

(201) 587-0090

Julia King, Management

(215) 532-7599

Washington, D.C., Bureau

Mitch Betts, Social & Legal Issues

(202) 347-6718

Gary H. Anthes, Government & Security

(202) 347-0134

West Coast Bureau

Jean S. Bozman, Open Systems

Kim S. Nash, Databases

Steve Moore, Networking

(415) 347-0555

Midwest Bureau

Ellis Booker, Networking

(708) 827-4433

Pacific Northwest Bureau

Stuart J. Johnston, PC Software

(206) 641-7770

Senior Writers

Melinda-Carol Ballou

Lynda Radosevich, Mary Brandel

West Coast Bureau

Mark Halper

Suruchi Mohan

(415) 347-0555

Staff Writers

Stephen P. Klett Jr., Jaikumar Vijayan

New Products Writer

Tim Ouellette

Research Coordinator

Stefanie McCann

Features Department

Senior Editors

Michael L. Sullivan-Trainor, CW Guide

Joseph Maglitta, Corporate Strategies

Lory Zottola Dix, In Depth

Allan E. Alter, Management

Kathleen Gow, In Depth

Associate Editors

Jodie Naze, Careers and Marketplace

David B. Weldon, Management

Cathleen Duffy, CW Guide

Senior Researcher

Kevin Burden, Firing Line/Scorecard

Assistant Researcher

Erin Callaway, Resource Center

Fuegeiman Intern

Renee Barber

Special Projects Editor

Bruce Rayner

Senior Research Manager

Bob Fink

Chief Copy Editor

Anne McCrory

Assistant Chief Copy Editor

Christina Aicardi Maguire

Senior Copy Editors

Kimberlee A. Smith, Jill Zolot

Ellen Fanning

Copy Editors

Michelle J. Keyo, Jay F. Rizoli

Kimberly Gilliard, Michelle Grabon

Design Director

Tom Monahan

Senior Graphic Designer

Nancy Kowal

Design Assistant

Janell Genovese

Graphic Designers

Stephanie Faucher, Mary Beth Welch

Graphics Specialist

Jose E. Bruzual

Cartoonist

Rich Tennant

Office Manager

Linda Gorgone

Editorial Assistants

Lorraine Witzell, Connie Brown

Aleksandra Skulte

West Coast Bureau

Chris Flanagan

Computerworld Client/Server Journal

Alan Alper, Editor

Catherine McCrorey, Managing Editor

Electronic Marketplace Liaison

Lisa Davidson

Rights and Permissions Manager

Sharon Bryant

Main Editorial Office

80x9171, 375 Cochituate Road

Framingham, Mass. 01701-9171

(508) 879-0700

TDD: (800) 428-8244

MCI Mail: 279-6273

CompuServe: 76537,2413

Subscriptions: (800) 669-1002

No need to fear the Year 2000

Michael B. Cohn

Quit whining already! Enough about the cataclysmic Year 2000. Dates recycling to 01/01/00? Systems crashing right and left? What do you think we are, a bunch of morons?

Sure, there was a time when we took three compiles to center a heading. But today, we're seasoned, competent and, perhaps, somewhat underpaid professionals. Date fields are child's play; 2000 will be a piece of cake. We've faced worldwide systems changes before and passed with flying colors. The only exception was Leap Year '72 when we shut the system off for a day and had everyone stay home.

Fear not the next millennium. It pales when compared with the major modifications we wrestle with today. If you want to talk about some really scary changes, think about these:

Dollar-amount fields. Every bank in America is bracing for the day when they will have to expand account balance fields by a few digits to accommodate the growing national debt or Bill Gates' checking account.

The nine-digit ZIP code. Did we panic? No, we handled it. Today, I bet every major system is equipped for the nine-digit ZIP... every system except maybe the U.S. Postal Service's.

Phone numbers. There used to be just a few million phones. Numbers totaled 10 digits — plenty to choose from. Then one day we wake up and every American has a home, work, fax

and cell phone. Do the math, folks. We're about to run out of numbers. We'll fix it and not by expanding to 11 digits. That software nightmare would have us working overtime until the Jets win the Super Bowl. Let's just add a key, like the @ or something. What's wrong with 867-@309? Internet users would love it. But retrofitting every phone might be a little tricky, especially the rotary dial I have in the basement. But that's hardware and not our problem.

Metric. Programmers unite! Fight this metric thing. If it ever catches on in the U.S., we're toast. We couldn't even estimate the modifications, let alone figure out how many feet there are in a liter. That's why we advocate the 7-Eleven Standard: S/M/L. That stands for Short/Medium/Long, Some/More/Lots or whatever you want. It takes just one byte, eliminates that centi/milli/kilo stuff and seems much easier than remembering how many cups there are in a quart.

Social Security numbers. I don't know what happened to birth control, but we're running out of Social Security numbers. Expanding to 10 digits is out; it would take more than

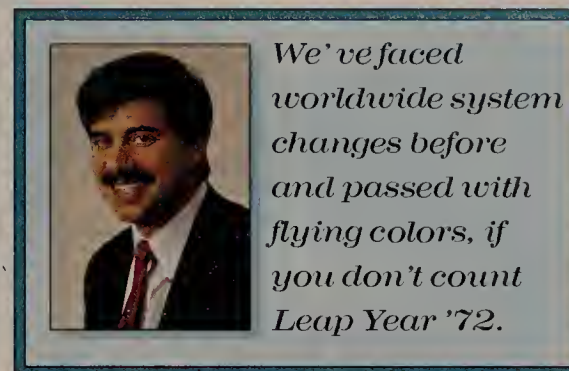
two years to redo every tax form. Then again, if the IRS wants to lay low until 1997, I wouldn't object. Our solution is to change the all-digit Social Security numbers to alphanumerics — allow numbers and letters. I don't see any downside, unless they came up with nauseating personalized Social Security numbers that made an "RUAQT2" license plate seem mild.

Time. No one has to think about things like this but us. Thanks to global systems, nationalized banking and electronic data inter-

change, time fields are becoming a problem. It's 2 a.m. in Trenton, N.J., but still yesterday in Eugene, Ore. Post the interest? Is the payment late? Does California lose a day's pay if I run payroll?

It's late, I'm tired, this project can wait until tomorrow. But for somebody, somewhere, it *is* tomorrow. With that kind of head start, I hope he comes up with something or at least lets me know if I'll need an umbrella.

Cohn is author of the humor book *Fear of Computers* and is trying to lay low until the Year 2000 at a large high-tech company.



We've faced worldwide system changes before and passed with flying colors, if you don't count Leap Year '72.

Let the NII grow naturally

Esther Dyson

What is the best way to think about the emerging National Information Infrastructure (NII)? Or better yet, about the global information infrastructure? The super-highway metaphor doesn't really fit the bill — starting with the notion that government should build it. Much of the infrastructure exists already; all we need are better ways to interconnect the existing elements and make them more powerful. This will happen mostly through natural market forces as private companies build the infrastructure to make profits based on the hope that users will pay to receive or distribute information.

The key word is hidden in what I just said: natural. The growth of the NII will be a natural process, and the best metaphor is an ecosystem — a self-organizing environment containing a host of co-evolving species.

What does the metaphor tell us? First of all, it says a lot of this will happen by itself. Second, there will be more than one business model.

People think of Darwinian evolution as a nasty process that results in a couple of monopolistic winners and a host of losers, but the reality is more complex. Evolution leads to a diversity of species and forces companies to differentiate and become better at their chosen models. Specifically, we'll have businesses modeled both on TV and the Internet; we'll have text services and multimedia; we'll have payment by advertisers and user-pays; we'll have transaction

fees and time charges. But we'll have competitive, evolved forms of each and some entries that will disappear.

Like the environment, the NII ecosystem is a robust, self-healing environment that can be harmed by human misbehavior. But it will take a lot to destroy it. Similarly, it too contains humans and can be a good place for them, but it may also be unfriendly, dangerous and confusing. There should be different neighborhoods with different rules: family-oriented, teen-oriented, commercially oriented, even hangouts for lawyers. The nice thing about cyberspace is it's easy to move

from neighborhood to neighborhood.

There is a place for government and laws, but it's a limited role. Specifically, as much government as possible should be local — for virtual communities rather than geographical ones. But woe betide those who try to apply their laws to other communities. Cyberspace law as a whole should simply try to keep communities and individuals within those communities from harming other communities.

Finally, the NII ecosystem is not yet well understood. Just as people of good intentions argue about the best way to deal with forest fires — whether they are nature's way of maintaining itself or disasters to be controlled — so too will people argue about the best way to handle the "forest fires" of the NII. Should we try to eradicate all viruses to keep ourselves safe or should we tolerate them a little so we maintain an immune system and people get used to safe computing practices? Should we encrypt everything, outlaw encryption or just let levels of practice and standards evolve?

The answer is we don't know. The wonder of an ecosystem is that it tolerates a lot of experiments and usually lets the best answers win — if we let it.

Dyson is president of EDventure Holdings, Inc. in New York. She welcomes readers' thoughts and can be reached on the Internet at edyson@eff.org.

The growth of the national information infrastructure will be a natural process.



OUR PENTIUMTM CHIP SYS NASTY SURPRISES



*Prices valid in the U.S. only. Some products and promotions may not be available outside the U.S. Prices and specifications subject to change without notice. If you encounter a compatibility problem within 3 years after the original purchase, we guarantee that Dell's engineers and technicians will work with you to identify the cause and recommend a solution. For a complete copy of our limited compatibility guarantee, contact Dell at 1-800-933-4177. Guarantee applies to PC hardware only and does not extend to software or devices not intended to run on comparable ISA or EISA systems of the same vintage. **Actual credit will vary depending on configuration of trade-in system. Minimum purchase required. Asset recovery services provided by Aurora Electronics, Inc. For a complete description of Dell's 3-year Limited Warranty, please write to Dell USA L.P., 2214 W. Braker Lane, Bldg. 3, Austin, TX 78758-4053, Attn: Warranty. Business leasing arranged by Leasing Group, Inc. The Intel Inside and Pentium Processor logos and Pentium are trademarks of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

TECH IS READY FOR ANY THAT MIGHT POP UP.

The Dell® OptiPlex™ XL 590 system is engineered to make you ready for just about anything that may come roaring down the pike in the next couple of years.

This top-of-the-line Pentium™ chip system starts at just \$2449, yet it's better than any you'll find on the market today.

For starters, it has a PCI slot,



**DELL OPTIPLEX XL 590
90MHz PENTIUM
PROCESSOR-BASED SYSTEM**

\$2449

- Business Lease⁰: \$91/Month
- 8MB RAM/340MB Hard Drive
- 1 ISA/PCI, 2 ISA Expansion Slots
- PCI 64-bit Local Bus Video
- VS14 Monitor (14" CRT, .28mm)
- Plug-n-Play Capability
- PCI Enhanced IDE
- 256KB Cache
- 3-year Limited Warranty[†]

Order Code #300273



so it's equipped to handle the advanced PCI peripherals that will soon be introduced.

It's Plug-n-Play ready, so it's ready to go when Chicago is.

It has PCI Enhanced IDE, so you can easily add an IDE CD-ROM drive and IDE hard drives all the way up to 8.4GB, when the technology arrives.

And it has 64-bit PCI local bus video, so it's even ready for desktop video conferencing.

This system is also Energy Star compliant, which may soon prove invaluable. (Especially if you work for the Federal Government.)

In a nutshell, you can buy this system and relax for the next year or two. Maybe even longer.

That's because we not only save you money getting this system to the user's desk, we save you money while it's on the desk. And while getting your old PCs off the desk.

HOW THE DELL OPTIPLEX XL 590 SAVES YOU MONEY ON THE DESK.

Every Dell OptiPlex system comes with a three-year Limited Warranty[†] with hardware coverage above and beyond the norm. That includes your peripherals, factory-

installed NICs, even monitors.

These systems also come with a limited compatibility guarantee*. In other words, future technology



like ISA/EISA-based peripherals will work just fine with these PCs.

And we can custom-build your PCs, install customized peripherals and load in your proprietary software if you want.

We can even custom-tailor your service plans, so you'll pay only for the services you need.

HOW DELL SAVES YOU MONEY GETTING YOUR OLD PCs OFF THE DESK.

We'll be glad to get rid of your tired old PCs. And for each 386 you trade in, we can give you a credit towards the purchase of a Dell OptiPlex XL 590 system.**

Call us. With Pentium chip PCs at this price, it's a whole lot easier to start moving into the future.



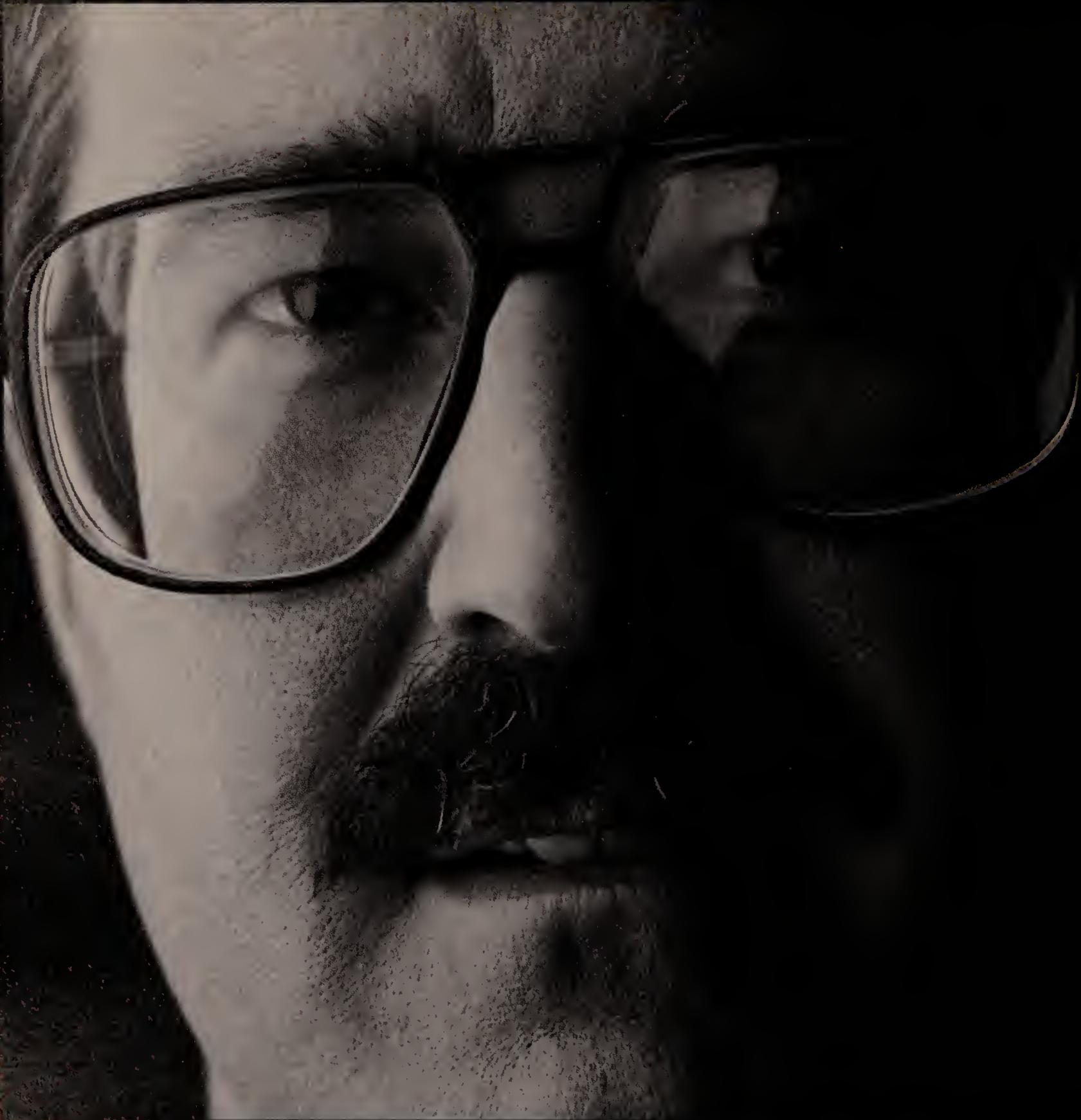
(800) 876-1190

MONDAY-FRIDAY 7AM-9PM CT • SATURDAY 10AM-6PM CT • SUNDAY 12PM-5PM CT
KEYCODE #11HS4 • CANADA* CALL 800-387-5755 • MEXICO CITY* CALL 800-228-7811

**GARY WAKEFIELD DOESN'T CARE IF YOUR SYSTEM IS MADE UP OF
HP, IBM, MICROSOFT, NOVELL OR WHATEVER.**

HE WILL MAKE IT WORK.

BUSINESS RECOVERY • ASSET MANAGEMENT • PHONE-IN ASSISTANCE • NETWORK DESIGN • SITE PREPARATION • PERFORMANCE MANAGEMENT • FINANCIAL



NETWORK SERVICES • EDUCATION • LOGISTIC & PARTS SERVICES • INSTALLATION • BUSINESS RECOVERY • NETWORK DESIGN • SITE PREPARATION • PERFORMANCE MANAGEMENT • FINANCIAL

SOFTWARE SERVICES • NETWORK MANAGEMENT • HARDWARE SERVICES • SYSTEMS MANAGEMENT • HELP DESK • CONSULTING • RELOCATION

Gary Wakefield - Program Manager, Support Services

He's one of over 17,500 HP service specialists worldwide. And no matter what hardware, software or network your system consists of, Gary and his team are there to take care of it.

Whatever services you need, you'll find that HP Service and Support

has little to do with our hardware. And everything to do with your system.

HP works on your side.





Multimedia on the chip equals savings for users

By Jaikumar Vijayan

■ Two efforts to run tasks directly on the CPU chip instead of on a separate processor could cause a rapid proliferation of multimedia on the desktop next year, observers say.

Intel Corp., along with digital signal processor (DSP) software vendor Spectron Microsystems, Inc., recently announced the availability of Intel Architecture SPOX (IA-SPOX). It is a real-time kernel and development environment that will enable signal processing tasks to run directly on the Pentium processor.

For users, the migration of these high-end functions to the processor could mean significant savings in costs associated with add-in DSP boards and cards.

Multimedia catalyst

Multimedia functions such as full-motion video, integrated data communications and telephony, which have begun to multiply in the market, are driving the need for on-chip signal processing capabilities, according to David Schuler, a marketing manager at Intel's architecture development laboratory.

"Multimedia software, particularly telephone management products, will proliferate in 1995 as a result of the introduction of DSP functionality in the mainstream PC," predicted Martin Reynolds, an analyst at Computer Intelligence InfoCorp in Cupertino, Calif.

"The cost of the hardware required to enable these features will be sufficiently low as to leave no option but to include it," he said.

Currently, these capabilities are packed in

separate DSPs that provide a wide variety of functions, including audio and video compression and decompression, data and fax communication, telephony and storage.

Until now, developers of Windows-based multimedia applications have had to off-load the real-time, compute-intensive multimedia portions of their applications to these separate DSPs.



Increased functionality

However, analysts said processors such as the Pentium and the PowerPC now have the level of performance to deliver DSP functions without a separate DSP. Full multimedia functionality can be harnessed from the hardware using the appropriate software, a 16-bit coder/decoder and a telephone interface.

For instance, with these hardware additions and the IA-SPOX operating system, multimedia functions run directly on software on the Pentium system. Intel calls this capability Intel Native Signal Processing.

"Signal processing software can extend multimedia system functionality in applications such as voice synthesis and speech recognition," said Brad Fluke, multimedia marketing manager at Crystal Semiconductor, a component manufacturer.

However, Intel 1486-based systems do not have the additional horsepower to run multimedia applications and will still require dedicated DSPs to harness their features.

The added functionality could have a down-
Multimedia, page 40

Suite developers wooed by vendors

By William Brandel

Once upon a time in the software industry, vendors tried to get developers to build applications for their platforms much like politicians try to win votes. They do not care who votes; they just want the highest tally.

honing what kind of applications and developers they want to offer users of their application suites.

In wooing development for suites, vendors are changing the question from "how many" to "what kind of" third-party applications. The result is significant for users, whose suite decisions

are no longer framed by which vendor has the most muscle to generate third-party development for their suites.

Better choices

More importantly, users will be able to compare suites based on what kind of applications run under them instead of

Courtship		
Vendors are hoping to woo suite development with the following programs:		
VENDOR	SUITE	PROGRAM
Microsoft	Office	Office Compatible
Lotus	SmartSuite, Notes	Business Partners, Professional Developers
WordPerfect	WordPerfect	PerfectFit Partners

Now, instead of promoting development only for operating environments such as DOS or Windows, vendors are pulling for the development of applications or add-on applets to run in conjunction with their application suites.

Much as candidates target a political message at a political constituency, the major PC software vendors — Microsoft Corp., Lotus Development Corp. and WordPerfect, the Novell, Inc. Applications Group — have spent the autumn

lining up four or five bundled applications against one another.

"By approaching suites from this perspective, users will be able to leverage more dollars out of their suite purchases," said Karl Wong, principal analyst of workgroup software at Dataquest, Inc., a San Jose, Calif.-based market research firm.

Add-on applets offer other benefits to users. For starters, applets tend to cost a fraction of a full-
Developers, page 44



NOKIA MULTIGRAPH 447X

"The Multigraph 447X showcases the latest monitor technology...focus is crisp and colors are rich and uniform."
PC Computing

"The Nokia Multigraph 447X's supremely sharp picture and clever on-screen menu controls make it a winning choice among 17-inch color displays."
PC Magazine
Editors' Choice - 9/94

"Fresh from Finland, the Nokia Multigraph 447X has arrived with a winning combination of simplicity and elegance."
Windows Magazine

"The Nokia Multigraph 447X offers on-screen programming and extremely easy-to-use controls that set it apart from its rivals."
Windows Sources
Experts' Pick - 8/94

Winner Best Monitor - CEBIT '94

CALL YOUR RESELLER FOR ANOTHER GREAT QUOTE ON THE ULTIMATE 17" MONITOR.

MAXIMUM REFRESH RATE FOR EACH RESOLUTION					
RESOLUTION	640x480	800x600	1024x768	1152x870	1280x1024
447X-17"	110Hz	110Hz	90Hz	80Hz	75Hz

CALL 1.800.BY NOKIA FOR THE NAME OF A RESELLER NEAR YOU.



© 1994, Nokia Display Products, Inc. Multigraph and FullScreen are trademarks of Nokia Display Products, Inc. Reduces eyestrain when used with an appropriate graphics card. Prices and specifications subject to change without notice. All other trademarks are the sole property of their respective companies. The Energy Star emblem does not represent EPA endorsement of any product or service. Manufactured and designed in Finland in an ISO 9001 approved environment. E-Mail: bynokia@aol.com



IBM's voice system carves out user niche

By Thomas Hoffman

If the positive market acceptance of IBM's OS/2-based voice recognition systems is any indication, then the company's recent introduction of a Windows-based product should be equally appealing to doctors, lawyers and other professionals accustomed to working in Microsoft Corp.'s graphical user interface environment.

Last January, IBM began shipping an OS/2 version of its Personal Dictation System, a PC-based speech recognition system capable of identifying 32,000 words at a rate of 70 to 100 words per minute that costs less than \$1,000. Earlier this month, IBM changed the brand name to VoiceType Dictation and began marketing a similarly priced Windows-based system. It also unveiled PCMCIA and Micro Channel Architecture cards that allow mobile professionals to use the software with their IBM PC Co. ThinkPad laptop computers.

IBM's VoiceType Dictation for OS/2 systems has found a solid niche among doctors, lawyers and other professionals who are either engaged in high-volume word processing or cannot use a keyboard due to physical disability.

High praise

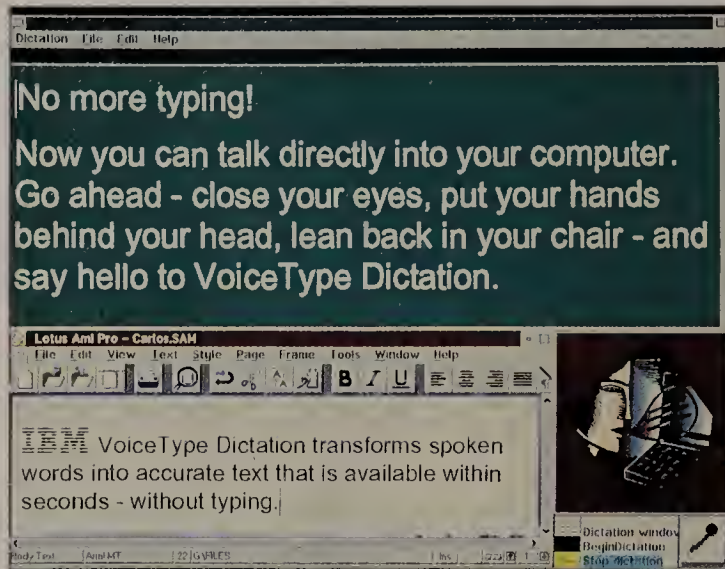
For example, David McFarland, a former Honeywell, Inc. product manager who retired 20 years ago after his battle with multiple sclerosis rendered him a quadriplegic, has been using the OS/2-based system to run a computer bulletin board from his home in Monroe, Conn., since February. McFarland, who has used a variety of speech recognition systems for the past 10 years, said IBM's VoiceType Dictation product is the best he has ever used.

"For straight keyboard replacement, IBM's system is light-years ahead — and I'm no great fan of IBM," McFarland said.

Unlike most speech recognition systems, which often have trouble understanding dialects, the IBM system can be trained to recognize users' accents and speaking patterns. Users must first train the system to understand their pronunciations by reading a Mark Twain short story for 90 minutes. Each time the system is used thereafter, it continues to learn how to interpret the user's speech.

The VoiceType Dictation systems boast a 97% accuracy rate, according to Howard A. Fields, director of marketing at IBM's Speech & Pen Products division.

The IBM systems also rely on trigram technology, which enables them to statistically predict what the third word in a phrase will be based on user speech patterns. That helps accelerate the recognition of like-sounding words



IBM's VoiceType Dictation systems boast a 97% accuracy rate

such as "to," "two" and "too."

The system has been a boon for doctors such as Ted Fifer, a plastic and hand surgeon in Effingham, Ill., who has been using the OS/2 system since August to generate progress notes for surgeries he has performed. Fifer, a loyal OS/2 user who has no plans to migrate to Windows, said he plans to examine the new PCMCIA cards.

"Because I go to outlying clinics to visit patients, [the PCMCIA feature] would enable me to have a portable dictation system to do correspondence on the spot," Fifer said.

Other OS/2 users planning to remain loyal to IBM's 32-bit operating system would like to see the company add other enhancements to their software, such as a wider variety of specialized vocabulary.

For example, Dr. Paul White, a general surgeon at Beth Israel Hospital in New York who has used the OS/2 version since April, said

IBM's emergency medicine vocabulary is not quite in sync with many words he is accustomed to using. "My system is about 90% accurate. If I was able to delete words, [the system] would probably go a lot faster with fewer errors," White said. He added that he was otherwise satisfied with the software.

Users must first train the system to understand their pronunciations by reading a Mark Twain short story for 90 minutes.

Multimedia

CONTINUED FROM PAGE 39

side, however, according to Ted Julian, an analyst at International Data Corp. in Framingham, Mass.

Despite the processing capabilities of the Pentium and PowerPC processors, the emergence of multitasking, multithreaded operating systems such as Windows 95 could task processor capability to the fullest, for instance.

Despite the lower systems

costs of implementing multimedia directly on the processor, "the question is, as people expect to do more multitasking kinds of applications, will processor capability be impaired by the added DSP functionality?" Julian asked.

Voice apps edge into mainstream

By William Brandel

One day, you will be able to operate your desktop system simply by speaking to it. Really.

With enabling technologies being brought to market by third-party vendors, many of the major vendors are starting to build voice recognition capabilities into at least their mainstream offerings. In fact, some products that run in the Windows and OS/2 environments have already found their way to users.

For example, Phil Terry, technical training specialist at Moody's Investor Service in New York, is using the Kurzweil Voice for Windows 1.2 from Kurzweil Applied Intelligence in Waltham, Mass., for all his data manipulation. Terry has epicondylitis, a carpal tunnel syndrome-like repetitive stress injury in his hands and wrists.

"Because of all the trouble I've been having with my arms, I simply could not use a computer," Terry said. He uses the product for the mouse- and keyboard-activated commands he would have performed with all his Windows applications.

More on the way

Other vendors are joining the fray. IBM is offering an OS/2-based system (see story at left). Meanwhile, desktop application makers such as WordPerfect, the Novell Applications Group, are building strategic alliances with a number of vendors to bring voice recognition capabilities to their applications suites. Microsoft Corp. is expected to deliver a voice recognition application programming interface that will run with Windows 95.

The enabling technologies will be made available from companies such as Kurzweil, Kolvox Communications, Inc. in Toronto and Verbex Voice Systems in Edison, N.J., among others. Their technologies, when combined with audio cards, will bring voice recognition systems to general productivity applications such as WordPerfect's word processor or Microsoft's Excel spreadsheet.

Like other enabling technologies, voice recognition is just beginning to gain acceptance as users find that the technology is

more than a novelty and is usable, said Mary Ann McCarthy, an analyst at "Voice Information Associates," a market newsletter in Lexington, Mass. Moreover, as the price for the combined hardware and software falls to the commodity level, the technology becomes more likely to find its way to users' desktops, she said.

Product accessibility

For example, Digital Communications Associates, Inc. in Alpharetta, Ga., is bundling Verbex's voice recognition system with its Irma line of client connectivity products. The new line of voice-recognition-enabled products, called

Listen for Irma, will be bundled with the company's QuickApp and QuickPeer at no extra charge, beginning this month. Listen for Irma will be available in stand-alone mode for \$49 in the first quarter

of next year.

As the introduction of Listen for Irma demonstrates, voice recognition products have come a long way toward the commodity price points in the desktop applications

industry. Selling for more than \$5,000 only two years ago, voice recognition packages that performed dictation and had the hardware board and the software to drive it can now be sold in packages for less than \$1,000, said

Jackie Fenn, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn.

Voice Information Associates predicts that the voice recognition market will hit \$647 million by 1997, up from \$159 million in 1992. However, the technology that will take the market to this kind of growth in the mainstream is not expected to hit the streets for another year, Fenn said.

"Desktop systems still mimic menu interfaces," Fenn said. "And while these may save some users a second or so in time, they have yet to prove that they can cut the users' bottom line."

If Terry is any indication, the jury is still out on whether voice recognition will grow beyond a niche technology. "There is a growing recognition that voice recognition will be an important mode of input," he said. "[But] it's still not clear what role it will play in the rest of the company."



IBM's VoiceType Dictation systems for OS/2 and Windows support six languages.

Go mobile. Take your network on the road with NetWare Connect.



Being mobile once meant being disconnected from all your computing resources. With NetWare Connect™, being mobile means having complete access to your network.

NetWare Connect allows you to take your whole network on the road. From any laptop, you can access E-mail, groupware applications, file, print and other network services. All this using standard off-the-shelf communications products.

As a user, you'll love the seamless connectivity. As a network manager, you'll appreciate how easy it is to consolidate inbound and outbound communications on a single platform. Your network will be more

manageable and secure with NetWare Connect.

With all these features, it's no wonder that NetWare Connect is supported by the industry's leading software and hardware vendors. Act

now, and you'll get a 30 day free trial and up to

\$750 in rebates on Cheyenne's FAXserve™

for NetWare® when you purchase

NetWare Connect before ~~Oct 31~~, 1994.

Before you take to the road again, call 1-800-BUY NOVL or your local reseller

to learn more about going mobile with

NetWare Connect. And discover a seamless

way to increase productivity on the road.

 **NOVELL**

The Past, Present, and Future of Network Computing.

**CALL 1-800
BUY NOVL**

*Extended
thru Dec. 31*

Introducing 1200 dpi printing from Lexmark. We're not re-inventing the wheel. Just the laser, the toner and the print quality.

The new Optra: extraordinary laser printing. At ordinary laser prices. Lexmark invented the 600 dpi standard. Now we're surpassing it with the Optra™ family of high-performance, network-ready laser printers. The first desktop printers with true 1200 x 1200 dpi* printing. Four times the sharpness of an ordinary 600 dpi printer.



The Optra's sleek exterior merely reflects the technical advances inside. Lexmark's print engine has been redesigned from the ground up. Even the toner has been reformulated. Industry standard PostScript™ Level 2 and enhanced PCL®5 emulations are built in. The result: you'll see incredibly sharp graphics—even photographs—and beautiful, crisp text from virtually any application.



Each member of Lexmark's new Optra family also delivers superior networking connectivity and support. With Lexmark's MarkVision™ bidirectional printer utility, users and LAN  managers can control and configure every Optra printer on the network, and monitor job statistics from Windows,™ simply by pointing and clicking.

For more information about the Optra family from

Lexmark, a former division of IBM, call 1 800 891-0399, ext 102.

The new 1200 dpi Optra. It's the first printer of its kind. And another first from Lexmark.

LEXMARK™

ADVANCING THE ART OF PRINTING



Handheld operating systems

Geoworks revamp raises performance, lowers price

By Michael Fitzgerald

Like the Little Engine that Could, Geoworks, Inc. thinks it can get over the hill of being a tiny company in a desultory market. The maker of handheld operating systems recently announced some initiatives that should put a little coal in its engine.

The company is hoping that its biggest drivers will fuel a strong future. These include Geos 2.1, a new version of its operating system for handhelds, and Geoworks Bindery, an authoring tool that may help spur development for the platform.

Geos is used on the Zomer personal digital assistant (PDA), which is marketed under different names by Tandy Corp. and Casio, Inc. Geoworks also has licensing agreements with Hewlett-Packard Co. and Novell, Inc.

A needed tool

Geoworks Bindery is a \$149 package that lets users build customized "books" oriented toward handheld products.

One analyst said Bindery is an important tool for Geoworks.

"Right now you really have to be into C to program for their device, so they need-

ed a tool like [this]," said Jeffrey Henning, an analyst at Constellation International in Norwell, Mass.

Meanwhile, Geos 2.1 now runs on less memory and uses an execute-in-place (XIP) technology that lets it switch between applications more rapidly. The speed of such switching has been a significant problem in the current release of the operating system. The XIP technique means Geos executes applications directly from ROM, rather than loading them into RAM. This lets them run in 500K bytes of RAM, down from 1M byte for the current version.

"With our target machine, you don't have a hard drive" to run software from, said Gordon Mayer, president and chief executive officer at Berkeley, Calif.-based Geoworks.

The reduced memory requirement and improved performance should pave the way for PDAs to be priced as low as \$300, which many analysts say they think is the price point needed to spur significant interest in the handheld market.

However, the company faces a struggle to make headway in a market that awaits Microsoft Corp.'s late At Work for Hand-

helds, also known as WinPad, which is due out in mid-1995.

"Microsoft has a tough challenge with WinPad because their approach has been to start with Windows and scale it down," Mayer said. "There are very few things you can point to that are scalable downwards. Look at the auto industry: In the early '70s when the gas crisis hit, the first thing the U.S. automakers tried to do [was] scale down, and their early efforts were the Pinto and the Vega."

Pervasive influence

Still, Microsoft is Microsoft, and Mayer credits it with developing market awareness of handhelds.

"In a way, they've done us a big favor with the hullabaloo they've generated about At Work and WinPad — they've educated the OEMs, shown a vision and in many cases gotten OEMs to develop hardware platforms," Mayer said.

Still, the market for handhelds is tiny, and unlike Microsoft, Geoworks has nothing but handheld products to generate revenue.

In fact, the company had planned to announce products at its developers' conference. But it canceled the meeting because potential attendees said they wanted information on the new third-party hardware that will run applications, and Geoworks does not expect these products to be out until next year.

Nothing funny here

Geoworks might hope to look back on its first full quarter as a public company one day and laugh. Revenue shrank 29% year to year, from \$1.6 million to \$1.1 million, and the company lost \$2.5 million, more than double the \$1.2 million it lost a year ago.

Developers

CONTINUED FROM PAGE 39

blown Windows application. Furthermore, because applets such as ShapeWare's Visio or Attachmate Corp.'s Extra connectivity tools were designed to run with the suite and not the operating system, they use up less system resources such as memory or storage.

This new raft of application development is very different from the free-for-all that was generated for Windows,

Users are builders too

All the major suite vendors say that at least 25% of the applets being built for their suites are being developed by users.

where tens of thousands of applications were built to run in the Windows environment. Vendors are being more selective this time around, trying to garner only those applications or applets that

will best exploit their suites' strengths. So far, Microsoft has had 55 applications developed for its Office Compatible program, a fraction of the support it gained for Windows at the same point in that product's life cycle.

No retraining here

For users, applets' most significant benefit is tight integration with the respective suite's user interface. This reduces the need to train users to use the new application.

For example, Autodesk, Inc. is developing a version of its AutoCAD software for Microsoft's Office suite. Users will be able to simply load it into Office and run it using the same menus and almost all the same commands found in the Office suite.

The applications from which users will be able to choose will be reflective of the suite vendor's corporate strategy. Lotus wants to encourage more high-end, groupware-enabled, document-based applications for its suite. As a result, SmartSuite has benefited from development efforts for Notes. An example of this is ElseWare Corp.'s development of Font Works, a network utility that ensures that formatted documents can be created and exchanged in both Notes and SmartSuite.

Do-it-yourself apps

Because WordPerfect's suite has not shipped yet, the applications that run with it are not available.

However, not all users are waiting for these add-on applications to be delivered. An increasing number are building these applets themselves.

"It would make sense that users would be interested in writing to these suites," said Jeff Tarter, editor of "Soft Letter," a newsletter based in Watertown, Mass. "The end users are used to a certain interface, and the corporate developer would not have to build one for them from scratch. It would be easier for everyone."

Get results like these when you migrate from an IBM mainframe to Unix.

"We made the scheduled migration date. Could not have done it without Workstation products. Needed capabilities that vi and other products didn't offer - only uni-XEDIT." ---Bellcore

"More feature rich than alternatives...the uni-SPF development platform put it head and shoulders above anything else." ---Chrysler

"Products were very portable and efficient. We don't believe there is anything else that will do the job." ---A.C. Nielsen

"Got our users up on new system instantly. The whole migration resulted in \$1M per year savings. Got applications moved in 4 months. On target and on budget." ---G.D. Searle

1-800-228-0255

wrk/grp the business choice
for open systems
the workstation group

New Products

Xionies, Inc. has announced XipView, a Windows-based image accelerator.

According to the Peabody, Mass., company, XipView uses a proprietary very large-seal integration chip for decompression rates of up to 40 document pages per minute.

Available in grayscale or color, the product is optimized for the display and manipulation of images in the Windows environment, providing decompression, accelerated Windows display, high resolution and high refresh rates.

The XipView color controller costs \$1,560. The XipView grayscale controller, which comes with a monitor system, costs \$2,495.

► Xionies
(508) 531-6666

Product short

Qualitis, Inc. has announced a bundle of its 386Max system memory management software with Borland International, Inc.'s Sidekick personal organizer. Cost: \$99. Qualitis, Bethesda, Md. (301) 907-6700.

NOW

- Revolutionize the way you work.
- Print, copy, and fax without leaving your desk.
- Optimize productivity and performance.

Y

O

U

Canon has created a totally new concept in digital office equipment systems that redefines productivity and performance. The Digital Imaging System GP55 Series. It's the culmination of Canon's technological vision that is designed to meet your needs now and in the future. It functions on your network as a 30-ppm, 400 dpi laser printer that can staple, sort, and duplex. It's also a digital copier and can serve as a Group 3 Fax. All this without ever having to leave your desk.

The GP55 Series does it all — with a unique, optional Multi-Device Controller (MDC) that gives you the flexibility to configure function boards to suit your needs. And since

the GP55 Series utilizes parallel processing technology, it can perform more than one function at a time. But best of all, the GP55 Series interfaces with standard network protocols and page description languages. So now everyone on your LAN can sit behind their desk and benefit from the power of Total Document Management. Which makes this a true instrument of efficiency and productivity — with the reliability you've come to expect from Canon.

As usual, Canon's advanced technology moves you further ahead. When the rest say you can't, Canon says you can.

For more information, call
1-800 OK CANON.

C

A

N

Canon



ORACLE WANTS YOU TO GET RID OF MAY WE SUGGEST THE ONLY REAL

It's time for you to fix bayonets. And hold the line on your mainframe.

Oracle's desire stems from a fundamental deficiency in its system architecture. Theirs was never designed to integrate the mainframe. No migration strategy there.

But Sybase's was — from the start. We've been building solutions to leverage the mainframe for ten years.

With SYBASE®, old mainframes never die. They just lose their limitations.

IT'S A CLIENT. IT'S A SERVER.
IT'S WHATEVER YOU
NEED IT TO BE.

Architecture is the key to interoperability. With Sybase's truly open architecture, your mainframe is more valuable

today than it has ever been before.

Suddenly the mainframe plays so many more roles. It's a great data warehouse. Its processing speed makes it a very powerful server. And it's a client, too. For instance, a mainframe-based application can access a UNIX database, just as though that database was on the mainframe.

With Sybase's Enterprise CONNECT™



YOUR MAINFRAME. A REASONABLE RESPONSE.

With Sybase's interoperability products, you can get data in and out of the mainframe without violating the security or business logic you rely on. So you can safely give read/write access to more users, to handle more transactions, at PCs and workstations throughout your enterprise.

That's what true interoperability is. Oracle's capabilities are clearly no match.

BIG COMPANIES LEVERAGE THEIR BIG IRON.

700 of the Fortune 1,000 have integrated their mainframes with SYBASE. With Sybase's best-of-breed products, they know that whatever they wish to integrate can be integrated. Open architecture gives them the flexibility to allow

changing business needs to drive their computing — not the other way around.

If your business is anything like theirs, you need your mainframe too.

As for those who would tell you otherwise, give them their marching orders.

WHAT THE CUSTOMERS SAY:

"When I hear people talk about getting rid of the mainframe, I know they don't understand my business. For us to be successful, we need to maximize all of the computing resources available to us. That means connecting desktop workstations, LAN-based servers, and the mainframe into a seamless and powerful information enterprise. Sybase's Enterprise CONNECT has enabled us to do just that."

— Bob Thompson, Supervisor of Database Administration at Towers Perrin, an international management consulting firm.

"Sybase enables us to offer a new standard of client applications which leverage our existing mainframe databases. Our clients are experiencing dramatic increases in user productivity along with reduced application development time on our part."

— Ken Carbullido, Director Open Data Streams at First Data Resources, the world's largest third-party processor of credit and debit card transactions.

To get a free copy of our new brochure, "Client/Server Solutions for the Mainframe," call 1-800-SYBASE-1, ext. 6610.



SYBASE

THE ENTERPRISE CLIENT / SERVER COMPANY

Announcing **COMPUTERWORLD CD**

Search Over 25,000 Articles in 30 Seconds – from Your Desktop

The editors of COMPUTERWORLD are pleased to announce the arrival of COMPUTERWORLD CD. Now, all the valuable information that you rely on every week is available through the exciting technology of CD-ROM. Just think, four years of COMPUTERWORLD at your fingertips...no more piles of back issues in the corner, no more frantic searches through pages of newsprint...years of COMPUTERWORLD ready for searching, analyzing, cross-indexing and competitive analysis.



Here's What You Get When You Subscribe:

- Over four years worth of full text articles from COMPUTERWORLD.
- Selected graphics from each issue showing industry trends, product comparisons and more.
- Articles from COMPUTERWORLD's annual *Premier 100* and *Computer Careers* magazines.
- Detailed information from *The Premier 100* – data about IS budgets, profit growth, total scores and company highlights about all the Premier 100 companies.
- Over five years worth of articles from the *Journal of Information Systems Education*, published by DPMA's Special Interest Group on Education (EDSIG).
- Annual subscription includes four discs updated quarterly.

COMPUTERWORLD CD Helps You:

- Search comprehensive product and vendor information quickly.
- Follow critical technology trends.

- Analyze top company IS profiles.
- Execute key word searches on any topic in seconds.
- Eliminate mass paper storage.

Easy-To-Use

Our powerful search and retrieval capability will deliver exactly what you are looking for in a matter of seconds...its simple...all you need to do is type in either a word or phrase related to your questions.

Plus, COMPUTERWORLD CD features multi-platform compatibility on PC (DOS and OS/2), Mac and Windows environments.

Become A Charter Subscriber and SAVE \$100

Subscribe today and become a charter subscriber for just \$295. You save \$100 off the regular annual subscription rate of \$395.

Don't miss this opportunity to have quick access to the most powerful news source on information systems.

To order call:
1 (800) 285-3821.

(Outside the U.S. call (508) 879-0006).

What users like about COMPUTERWORLD CD:

"It can look up products and company names...indispensable."

"...finds product information and client information quickly."

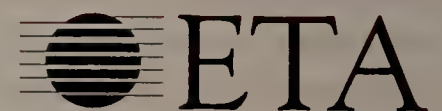
"...full base text, good graphical start for each article."

"Can search across multiple issues and find the thing I'm looking for. Makes life easier."

"The sheer volume of what's in it. Easy access without having to go to a library service."

"It has information not found on Computer Select."

Source: Survey of COMPUTERWORLD CD subscribers, May 1993.



Emerging Technology Applications
Attn. Sales Department
111 Speen Street, Framingham, MA 01701

Arcada, Cheyenne battle for NT backup market

By Mary Brandel

There is a war brewing in the NT backup market.

For the past eight months, Arcada Software, Inc. has been the reigning (and only) supplier of backup software for Microsoft Corp.'s Windows NT operating system. Its third iteration of Backup Exec for NT, slated for an early 1995 release, was demonstrated last week at Comdex/Fall '94 in Las Vegas.

A few booths down from Arcada was Cheyenne Software, Inc., the king of backup in the Novell, Inc. NetWare world. Cheyenne also wants a piece of the NT pie. It just recently announced Arcserve for NT, which is slated to ship next month.

Not surprisingly, the barbs are flying.

Age vs. fame

Arcada's biggest claim is experience: Its product is in the third release, while Cheyenne's is Version 1.0.

Cheyenne has huge name recognition on its side. "I'd heard some cautionary words regarding [early versions of] Arcada," said Robert Truxall, vice president of product development at the Strategic Solutions Group in Inglewood, Calif. Truxall said he is leaning toward Cheyenne because "we've been real happy with Arcserve on Novell."

However, "Cheyenne will have to do more than just a comparable offering if they want a significant portion of that marketplace," said Rob Enderle, an analyst at Dataquest, Inc. Arcada's "license base is growing on NT by leaps and bounds."

Missing features

So far, Cheyenne's NT product is not on a par with its NetWare product. The vendor plans to release a series of NT products that by mid-1995 will incorporate all

the features of the NetWare version, said Jon Greene, Windows NT product manager at Cheyenne.

One user lamented the missing features. "There's no AutoPilot," said John Matthew, president of CompUnique, Inc., a consultancy in Sherman Oaks, Calif. "That's depressing." AutoPilot, he explained, enables users to preschedule backup jobs.

Neither is there support for heterogeneous clients. On its side, Arcada promises Unix and Macintosh agents in its January release.

Managing backup

A third disappointment for users is that "you can't control backup from any workstation on the network," Matthew said. "You have to be at the server."

The ability to manage backup from a remote workstation is an important change to Arcada's upcoming product, said David Greenberg, director of new systems development at Orlando Health Care in Florida. In addition, it will run as a server-based process. With the current version, "if a server shuts down, somebody has to be there to log back in," Greenberg said. With the new version, "you just click a box for auto startup."

Cheyenne's planned release will also be a server-based process.

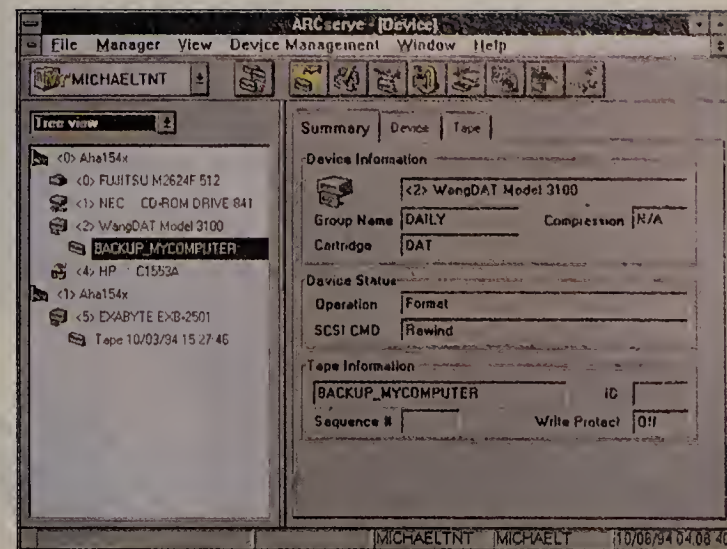
There are other key differences between the products, which include the following:

- Arcada's Version 6.0 release is expected to run on Intel Corp. hardware plus a variety of RISC platforms. Cheyenne said it has multiple hardware versions running in the laboratory.
- Cheyenne is using an interface that it claims is similar to Microsoft's planned next generation of Windows, Windows 95. "Instead of a top-and-bottom view of

what you're backing up, it's a side-by-side, tabular format," Matthew said.

• Arcada supports the Microsoft Tape Format, enabling users to interchange data with tapes backed up by the basic backup applet included in NT. Cheyenne supports its own tape format because it was important, Greene said, to ensure interoperability with its other backup software.

• Cheyenne's product costs \$895. Autochanger support is available as an optional module for \$595. Arcada has not yet set pricing. Its original Backup Exec for NT costs \$795.



Users said they were pleased with the tab type of screen format Cheyenne uses in Arcserve for NT

Storage efforts

Storage announcements at Comdex included the following:

- Want storage? Here's a terabyte of the stuff from **Procom Technology, Inc.** in Irvine, Calif. The firm unveiled RaidRack, a \$28,000 to \$750,000 disk array subsystem targeted at the high-performance workstation market.
- On the optical side, a number of vendors announced quad-speed CD-ROM devices. For example, **Toray Optical Storage Solutions** released the Phasewriter Dual 5 $\frac{1}{4}$ -in. drive, which is designed for multimedia PC users who want to use CD-ROM and rewritable optical discs in the same drive.
- Two companies are now selling stor-

age systems that mix and match media. **Mega Drive Systems, Inc.** in Beverly Hills, Calif., released Mega-Drive Enterprise, which costs \$1,200 and accommodates optical, CD-ROM and hard drives, plus 8mm and 4mm tape. **MediaLogic ADL** in Boulder, Colo., is offering its Scalable Library Architecture product line, which incorporates 4mm, 8mm and Digital Linear Tape libraries.

• **Hitachi America Ltd.** jumped on the magneto-resistive head bandwagon, offering 1-in.-high, 3 $\frac{1}{2}$ -in. drives with 1G to 4.3G bytes of capacity. Shipment is slated for the second quarter of next year.

Commentary

Stan Schatt

Lessons taught in first grade

My wife's little first-grade students are making progress. Already, most of them have learned how to share toys, play with their classmates without fighting and work together in a spirit of cooperation.

I suspect Bill Gates must have skipped this all-important grade. The lessons he would have learned certainly would help Microsoft today in the networking market.

More importantly, they would make life easier for network managers who must live in a desktop environment controlled by the Redmond, Wash., giant.

One of the first lessons my wife teaches is how to work cooperatively. Remember the problems you had when you first tried to make Windows work in a Novell NetWare environment? Microsoft's answer was that this product would work much better in a LAN Manager environment. The public responded by continuing to choose NetWare over LAN Manager, so Microsoft belatedly made some effort to eliminate conflicts. Then Windows for Workgroups came out, and Microsoft mounted a campaign to bypass the NetWare manager by going directly to corporate end users. The pitch was, install Windows for Workgroups on your PC, gain your own nifty scheduler program and don't worry about that nasty network manager who's probably a NetWare lover. Unfortunately, that mean old

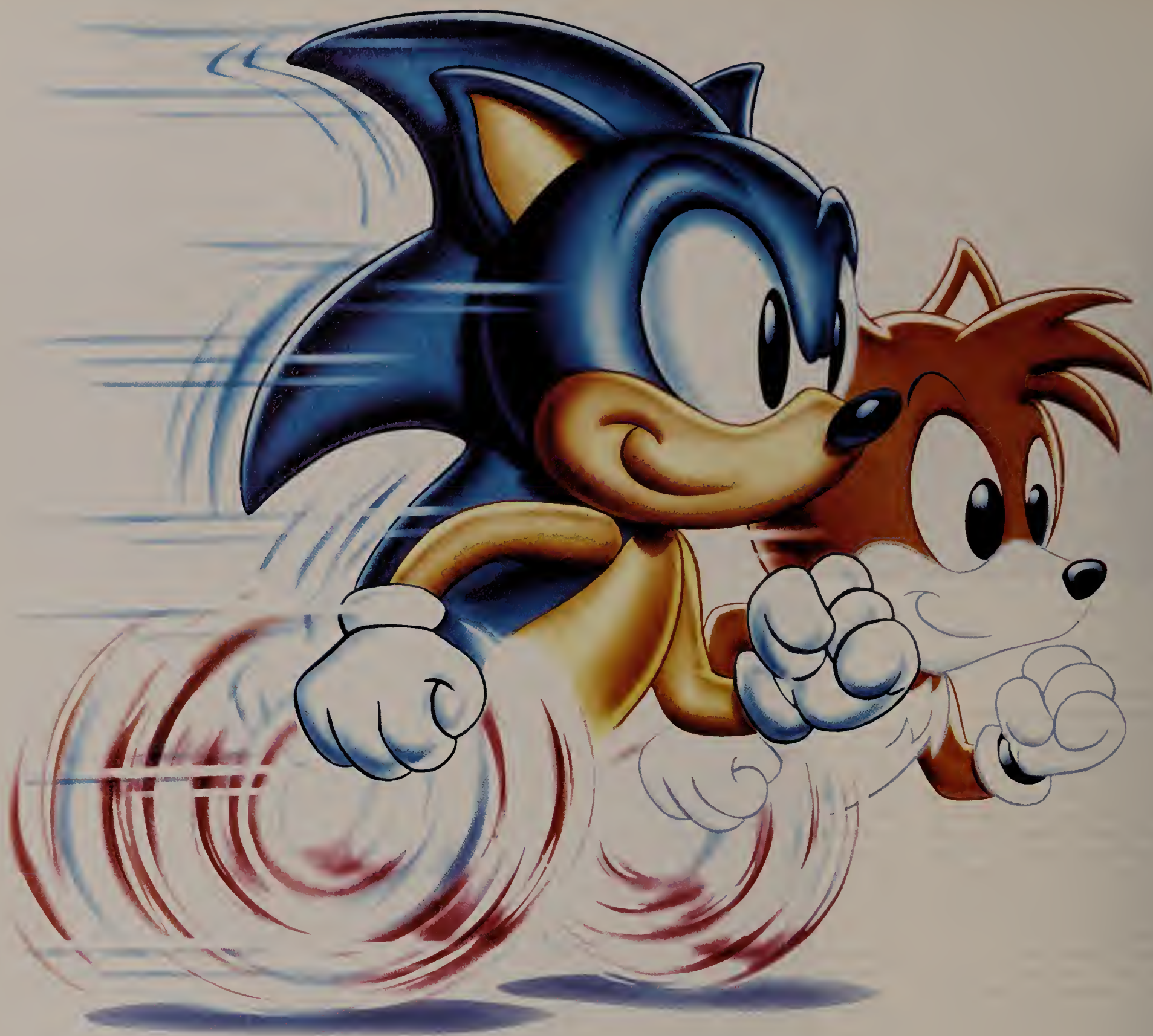


LAN manager often vetoed Windows for Workgroups on the grounds that it introduced new interoperability problems onto the LAN.

Bill Gates and Microsoft have long been confused about the networking market primarily because it requires a cooperative rather than combative stance. While Novell blossomed by consciously trying to grow the entire market via "coopetition," MS-Net and LAN Manager failed as Bill Gates pursued a burn-and-pillage marketing plan against Novell.

Have you ever called Microsoft about a network problem and received the admonishment that the problem is obviously a conflict with a non-Microsoft application? The implication is that other software companies must worry about compatibility and that Microsoft refuses to take responsibility to provide one-call support for the network as a whole unless

Schatt, page 51



Why Sonic The HedgehogTM Moves So Fast.

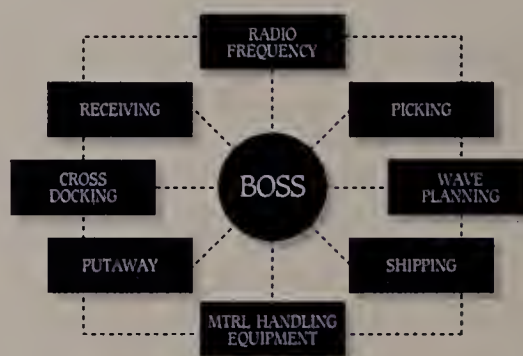
"Thanks to CA-Warehouse Boss," our warehouse was able to ship more games in September, '93 than we did in the past two years," says Bill Downs, Director of MIS for SEGA of America, Inc., the makers of the world's fastest moving video games like Sonic The Hedgehog.

CA-Warehouse Boss is totally integrated warehouse management software for the AS/400. It acts as "the central nerve center" that tracks every detail from arrival through departure.

"Not only has order turnaround time been drastically reduced, but we've achieved close to 100% shipping

accuracy. Shortage claims have been virtually eliminated," says Downs.

And because CA-Warehouse Boss is built using an advanced architecture, it can grow with any operation without costly custom programming.



CA-Warehouse Boss acts as a "central nerve center."

to CA-Warehouse Boss, just like SEGA did.



Call 1-800-225-5224,
Dept. 53102
For More Information And
A Free Demo Disk.

We'll tell you why it's time you moved

COMPUTER ASSOCIATES
Software superior by design.

New CA-Warehouse BossTM

© Computer Associates International, Inc., Ithaca, NY 14850-7000. Sega, Sonic The Hedgehog, and Miles "Tails" Prower are trademarks of SEGA. © 1994 SEGA. All rights reserved. All other product names referenced herein are trademarks of their respective companies. Offer good in U.S. and Canada only.

DCA, Simware unveil remote access software

By Suruchi Mohan

As well-traveled users increasingly rely on corporate data and telecommuting becomes more a reality than a fad, companies are vying with one another to provide the features users need to make remote access easy.

Digital Communications Associates, Inc. (DCA) in Alpharetta, Ga., and Simware, Inc. in Ottawa announced new versions of their connectivity products. DCA introduced Version 3.0 of its Remote LAN Node (RLN) client and server LAN access software, and Simware rolled out A2B Version 3.0, which provides LAN and host connectivity.

Although DCA does not tout RLN as a host connectivity product, the software does carry remote users a step closer to legacy data. "Any product that gets you to the LAN will get you to the host," said Val Sribar, program director of global networking strategies at Meta Group, Inc. in Reston, Va. Other features will determine whether the product stands out from a slew of competitors on the market, he said.

Unlike all the rest

Technically, DCA's offerings do not differentiate it from its competitors as much as do the company's size and global presence, according to Kitty Weldon, data communications analyst at The Yankee Group in Boston. But the company is interesting because it offers a software solution, which is always more flexible than a hardware upgrade, Weldon said.

One of RLN's interesting features is

OS/2 support. Not intended for the pure OS/2 environment, the product makes the network administrator's life easier by providing the same interface across DOS, Windows and OS/2, Sribar said.

Simware on the other hand prides itself on providing end-to-end automation in a Novell, Inc. NetWare environment, according to Chris Fedorko, vice president of marketing at Simware. Remote users need only click on an icon and the application automatically dials into the LAN and connects them to the whole network.

More accessible

The University of Ottawa is using A2B to do Digital Equipment Corp. VT100 emulation, which allows campus users to access Unix machines, said Jacinthe Mutchmore, assistant director of computing and communications services. A big advantage to using A2B is that all users have a common interface, regardless of location.

Previously, depending on the system they were accessing and their location, users had three to four interfaces, which made administration an extremely difficult task.

RLN 3.0 from DCA is available immediately; A2B 3.0 will be available next month.

The client end of the A2B 3.0 enterprise solution costs \$395 per user; the server ranges from \$650 to \$7,250. The client for remote LAN access only costs \$59.

RLN 3.0 is available for Ethernet and Token Ring configurations at prices ranging from \$895 to \$14,395, depending on the configuration.

Schatt

CONTINUED FROM PAGE 49

yours is a pure vanilla Microsoft world.

If Bill had gone to first grade, he would have also learned that there is nothing to be gained from being a bully. Software companies continue to fall behind Microsoft applications in implementing new Windows versions; this trend will continue despite the recent settlement with the Justice Department. What happens to innovation when small companies spend most of their time worrying that Microsoft will let them develop a new networking niche and then move in with its channel clout to drive out the small guys? Small companies also worry about being sued by Microsoft and being tied up in court for years while their revenue dries up.

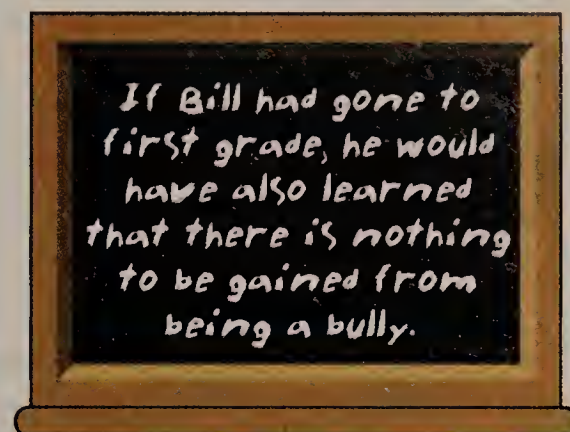
Asking for help

When first-graders have problems, they turn directly to their teacher for immediate assistance. Imagine what would happen if she asked them to call a toll-free number to help figure out their math assignment? What Chairman Bill and Microsoft have never understood about network managers is their desire for good hand-holding support and not simply a telephone/fax support line. A telephone support line might support a stand-alone product such as Excel, but it doesn't help the LAN manager who is panicked because the network is down and wants to talk to a real, live person—preferably someone in the same city.

Some first-graders must learn they can't dictate all the rules of a game simply because they brought their ball to school. If Windows 95 only permits access to Microsoft's Marvel on-line service and makes it difficult to dial into Compu-

Serve or America Online, I suspect customers will react much the way children do when a child threatens to take his ball home if he can't be the permanent batter.

Personal responsibility is also an important first-grade lesson. Children who volunteer for classroom jobs must perform them or the entire class suffers. If kids take books home to practice reading, they must return them the next morning so that there are enough books for everyone in the cash-starved school. In the past, Novell has taken responsibility for growing the entire networking industry in an unselfish way. Gates now must share that responsibility. This means working with industry associations to support all major standards. Some customers will want a Windows



networking environment and support a non-Microsoft E-mail standard, and others will want Novell's embedded NetWare rather than Windows At Work.

Bill Gates has done an incredible job building the world's most successful desktop software company. His lack of success in the network arena suggests he might need to learn some of the lessons taught as early as first grade. Unfortunately, I think he would find the tiny tables and chairs very uncomfortable.

Schatt is a LAN service director at Computer Intelligence InfoCorp in La Jolla, Calif.

Evergreen announces SMP upgrade for 486 machines

By Erin Callaway

Users thinking about multiprocessing could be in for a surprise.

At Comdex/Fall '94 last week, Evergreen Technologies, Inc. in Corvallis, Ore., unveiled what it claims is the world's first symmetrical multiprocessing upgrade for 486-based computers. By using the upgrade, users could get an extra mile out of their 486 servers and also benefit from multiprocessing power.

Supporting interoperability

Called Rev To SMP, the product is a dual-processor module designed to transform a uniprocessor 486-based computer into a symmetrical multiprocessing (SMP) system. By using the product, users can wed any combination of 486SX, DX, DX2, DX4 or Intel Corp. OverDrive processors, the company said.

Rev To SMP is compatible with CPUs from Intel, Advanced Micro Devices, Inc. and Cyrix Corp. and will eventually run

with processors from IBM, Texas Instruments, Inc. and SGS Thompson. Evergreen will demonstrate the module running with a beta version of IBM's OS/2. Rev To SMP is targeted to run with Microsoft Corp.'s Windows NT by the end of this year, Evergreen said.

James Greene, senior research analyst at BIS Strategic Decisions in Norwell, Mass., questioned why anyone would want to put SMP on the desktop.

"OS/2 or NT are such power hogs that people planning to use them have probably already got high-end workstations," Greene said. "As a server, this might make sense, but as a desktop stand-alone, I just don't see why you'd want to bother."

Evergreen is touting the upgrade as being faster than the Intel Pentium but has not yet benchmarked the module's performance. The multiprocessing power

will at least equal the power of a 486 server, a company representative said.

That possibility comes as good news to Bill Thomson, director of information technology at PrimeSource Corp., a shipping container leasing company in Burlingame, Calif.

"This could be ideal for prolonging the life of my Dell 486 D50 servers," Thomson said. "Even if it just adds one equal to what I've got now, it could be very useful given the utility."

More for less

George Loyer, vice president and general manager at Panttaja Consulting, Inc. in Healdsburg, Calif., agreed that the product has impressive potential as a server upgrade.

"If this product does what it claims to, it could mean getting 24 months out of a server instead of just 12," Loyer said.

In addition to prolonging users' initial investments, Evergreen said the up-

grade will cost only around \$2,000, even if users have to purchase two new high-end 486 processors.

Performance problem

Despite the upgrade's attractive price tag, Greene expressed serious doubts about Rev To SMP's supposed performance capability.

"This sounds like it could be an electrical nightmare," Greene said. "Unless you plan to upgrade the subsystem, two 486 chips would put a tremendous strain on the motherboard."

Greene also speculated it could increase problems handling I/O bottlenecks.

"Bottlenecks are already the biggest problem with servers," Greene said. "I just don't see how a 486 slapped on its side with a couple of extra processors will be any better."

Evergreen said it is arranging contracts to begin beta-testing Rev To SMP by year's end.





Insight: An Ex

Maximizing Return from

Sponsored by Dell Co

Equipping teams of mobile workers with notebook computers giving them access to the same automated tools and information their desk-bound peers enjoy makes intuitive sense. But does it make good business sense? The answer is a definite yes.

This is a key finding of a recent study of more than 400 large and medium-sized U.S. organizations involved in field force automation, conducted by International Data Corporation, the world's leading information technology market research firm.

The best protection for an initial investment in field force automation is continued investment

The business case for automating the field force is reported in this Insight. An in-depth discussion is available in a special IDC White Paper, *Field Force Automation: The Keys to Success* (see box, far right). The White Paper also details key factors of a successful field force automation program discussed in an earlier Insight.

According to the companies and government agencies polled, the business case for field force automation generally requires achieving a measurable return on investment (ROI). In order of importance, ROI was measured in terms of:

Key Benchmarks

- Average field force automation projects take 21 months from design through implementation and rollout.
- 45% of the costs are incurred in the first year of implementation for companies with a planning horizon beyond one year.
- 60% of companies felt their implementations met or exceeded expectations.
- Average first-year investment level is \$6,400 per user.
- Average investment payback period is 2.6 years.

- Internal productivity, such as order processing time, transaction rates, and revenue per employee
- Customer service, from satisfaction ratings to call handling and order turnaround statistics
- Field force approval, as evidenced in formal polls, actual usage of the application, and continued funding by field management
- Enhanced competitiveness, based on both informal feedback and on competitive operational measures, such as mean-time-to-repair, transactions per employee, or sales costs
- Financial returns, such as increased revenues or profits and other formal ROI calculations

Against these yardsticks, American companies generally report field force automation success ratios as shown in Figure 1.

Over 25% of respondents felt that field force automation had given them a sustainable competitive advantage. Given that over 70% of large and medium-sized organizations in the United States are involved in field force automation—generally in their second

or third generation—successful field force automation is likely to become a key factor in business success.

How Big an Investment?

The typical organization had dozens of workgroups. The average line manager's workgroup size was 100, and notebook computers were routinely ordered by the hundreds.

Automating a field force then is not just supplying workers with notebook computers and copies of Microsoft Office. It is a full, enterprise-wide application taking several years to implement (see Figure 2) and impacting thousands of employees.

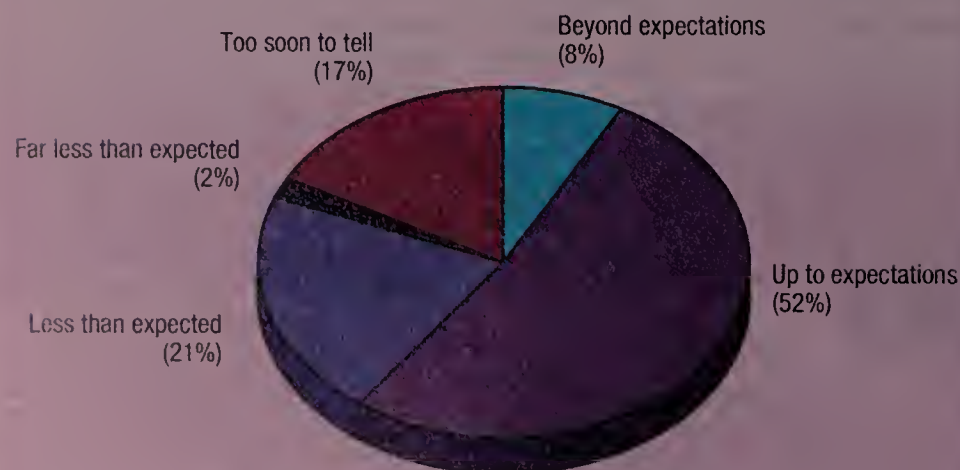
The investment required is not trivial. Companies in the IDC study reported an average first-year implementation cost per user of \$6,400, broken down as follows:

- Hardware, 50%
- Packaged software, 20%
- Internal software development, 15%
- User training, 9%
- Consulting, 4%
- Other staff, 4%

Cost-per-seat figures may, however, understate infrastructure costs such as

Figure 1 — The Track Record for Field Force Automation

Success at Meeting the Goals of Field Force Automation



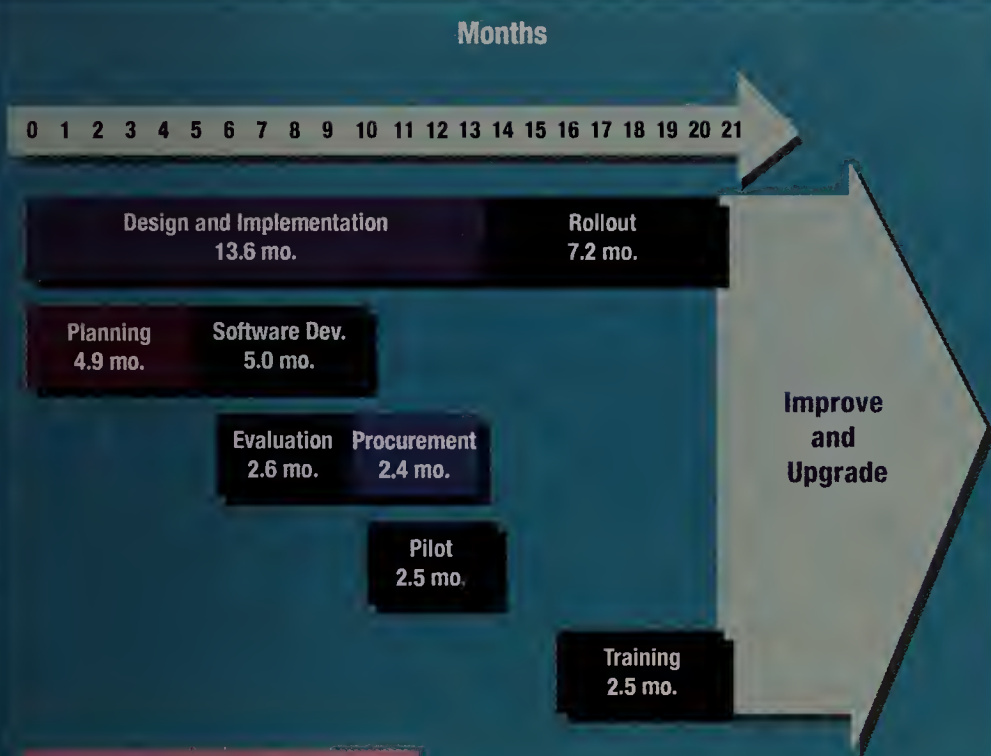
IDC Survey Results, Mid-1994, N=402

Executive Briefing

Field Force Automation

Dell Computer Corporation

Figure 2 — Implementation Cycle Time



those spent on initial implementation.

A major source of investment protection comes in the wise choice of vendor and technology. The average application takes one to two years from design to full rollout, and the average investment payback period is close to three years. The relationship between customer and supplier is long term in nature.

A supplier must have top-notch service and support, wide geographical reach, a continually refreshed product line, and a company reputation and viability beyond concern. The supplier must also understand the need for programmed upgrades and asset management, and be willing to disclose its own product plans and business directions.

The valuable vendor in today's mobile marketplace will provide its client a technology road map that offers guidance in deploying management resources, scheduling technology upgrades, and disposing of outdated equipment.

Only after a vendor meets these criteria does product price become an issue. The annualized cost of that notebook computer in a salesperson's briefcase is less than 1% of the investment in salary and overhead to keep them in the field. Quality equipment is a minimal expense in the total success formula.

The Call to Action

The research clearly shows that the business case for field force automation is a strong one. Payoffs are real and measurable. Achieving them is a matter of careful planning and execu-

Variations in the Field

Experiences with field force automation in the IDC study varied depending on industry and the area automated.

- Sales and marketing are less automated than customer service, accounting, or transaction processing functions.
- Manufacturing companies reported the highest percentage for sales automation—50% versus 35% for the total sample.
- Discrete manufacturing companies reported first-year per-user investments of \$7,800, versus an average \$6,400.
- Accounting and auditing applications have the shortest payback period—2.3 versus 2.6 years.
- Banks report the shortest time from design to implementation—10 months instead of 14.

tion: maintaining them requires continued commitment and ongoing technology investment—an investment with substantial return.

— John Gantz

Senior Vice President

International Data Corporation

This Insight was written independently by IDC and sponsored by Dell Computer Corporation. For a complimentary copy of IDC's full White Paper on Field Force Automation, please call Dell at 1-800-396-3040.

DELL

training, applications development, system and network management, phone bills, and overhead that are generally built into operating budgets. Unexpected problems during implementation in training, end-user support, and communications also caused unbudgeted expenses.

While the costs of field force automation may have been understated, the financial benefits probably were as well. The dollar value of an additional point of market share or a 10% improvement in customer satisfaction rating can be in the millions for a large or medium-sized company. Soft dollar returns actually may be bigger than hard dollar returns.

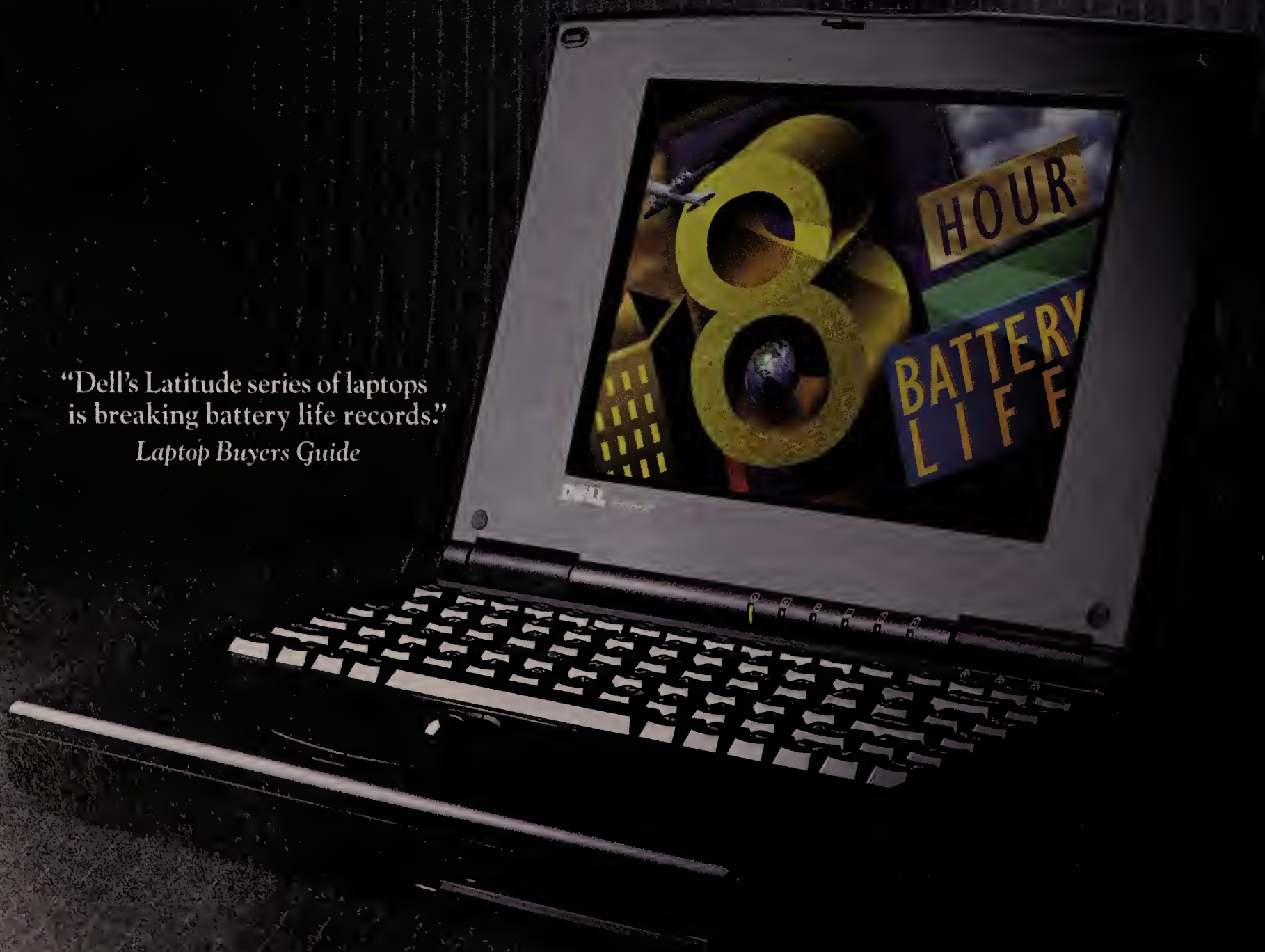
Protecting the Investment

Establishing an application is one thing—keeping it running and competitive is another. According to those companies claiming field force automation had given them a competitive advantage, the best protection for an initial investment was continued investment. Technology upgrade—improved hardware and software—was cited as most critical for ongoing success.

The need to keep upgrading will not diminish. Today's notebook computers are lighter and more powerful, batteries last longer, and desktop expansions and wireless networks make connectivity easier. Dollars spent on upgrading and improving field force automation hardware and software will go even further than

NOW THERE'S NO EXCUSE FOR NOT PUTTING IN AN 8-HOUR DAY.

"Dell's Latitude series of laptops
is breaking battery life records."
Laptop Buyers Guide



Quote from Laptop Buyers Guide and Handbook, Vol. 12, No. 9, p. 26. *Prices valid in the U.S. only. Some products and promotions may not be available outside the U.S. Prices and specifications subject to change without notice. †Business leasing arranged by Leasing Group, Inc. ‡Latitude is powered by a NiMH battery, with the option of replacing the diskette drive with a second NiMH battery. §For a complete copy of our 3-year Limited Warranty, please write to Dell Computer Corporation, 2214 W. Braker Lane, Bldg. 3, Austin, TX 78758. The Intel Inside logo is a registered trademark and IntelDX2 and IntelDX4 are trademarks of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

DELL® LATITUDE™ XP
IntelDX2™ 50MHz System

SYSTEM SPECS:

- 9.5" Dual Scan Color
- 8MB RAM (36MB Max RAM)
- 340MB Hard Drive
- New Smart Lithium Ion Battery
- 3-year Limited Warranty†

\$3199

Business Lease^o: \$118/Mo.
Order Code #300182

DELL LATITUDE XP
IntelDX4™ 75MHz System

SYSTEM SPECS:

- 9.5" Dual Scan Color
- 8MB RAM (36MB Max RAM)
- 340MB Hard Drive
- New Smart Lithium Ion Battery
- 3-year Limited Warranty

\$3399

Business Lease: \$126/Mo.
Order Code #300184

DELL LATITUDE XP
IntelDX4 100MHz System

SYSTEM SPECS:

- 9.5" Active Matrix Color
- 8MB RAM (36MB Max RAM)
- 340MB Hard Drive
- New Smart Lithium Ion Battery
- 3-year Limited Warranty

\$4799

Business Lease: \$173/Mo.
Order Code #600012

DELL LATITUDE
IntelDX2 50MHz System

SYSTEM SPECS:

- 9.5" Dual Scan Color
- 4MB RAM (20MB Max RAM)
- 200MB Hard Drive
- Second NiMH Battery-\$99 more
(Required for extended battery life)

\$2299^o

Business Lease: \$85/Mo.
Order Code #600022

DELL LATITUDE
33MHz System

SYSTEM SPECS:

- 9.5" Dual Scan Color
- 4MB RAM (20MB Max RAM)
- 200MB Hard Drive
- Second NiMH Battery-\$99 more
(Required for extended battery life)

\$1999

Business Lease: \$74/Mo.
Order Code #600009

(Systems Not Pictured)

HOW DELL GIVES YOU TRUE 8-HOUR BATTERY LIFE^Δ

The Lithium Ion battery in the Latitude XP notebook packs more juice into the same amount of space as older batteries.

*The Latitude notebook, our value-priced model, provides up to 8 hours^Δ by simultaneously supporting 2 NiMH batteries.**

Our exclusive power management software is designed to dynamically adjust energy consumption.

Dell's superior engineering combines the exclusive power management software with the advanced battery technology to give extended battery life.

^ΔActual battery life will vary depending on the nature and frequency of usage and configuration.

Well, well, well. Looks like the office laggards of the world have just met their nemeses. In the form of the Dell Latitude and the Latitude XP notebooks and their eight hours of battery life.^Δ

So, call us today to order your share of these true nine-to-fivers. And for once, experience eight full hours of work. With absolutely no excuses.

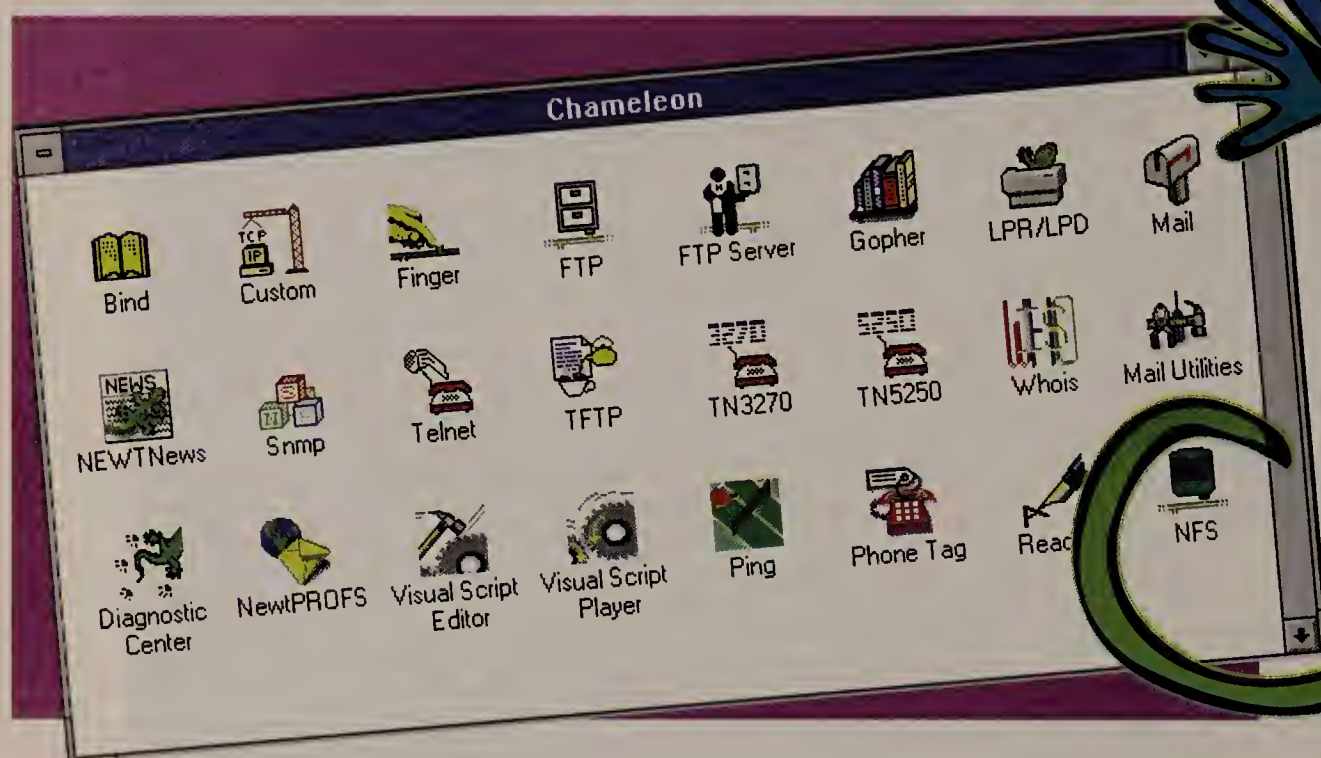
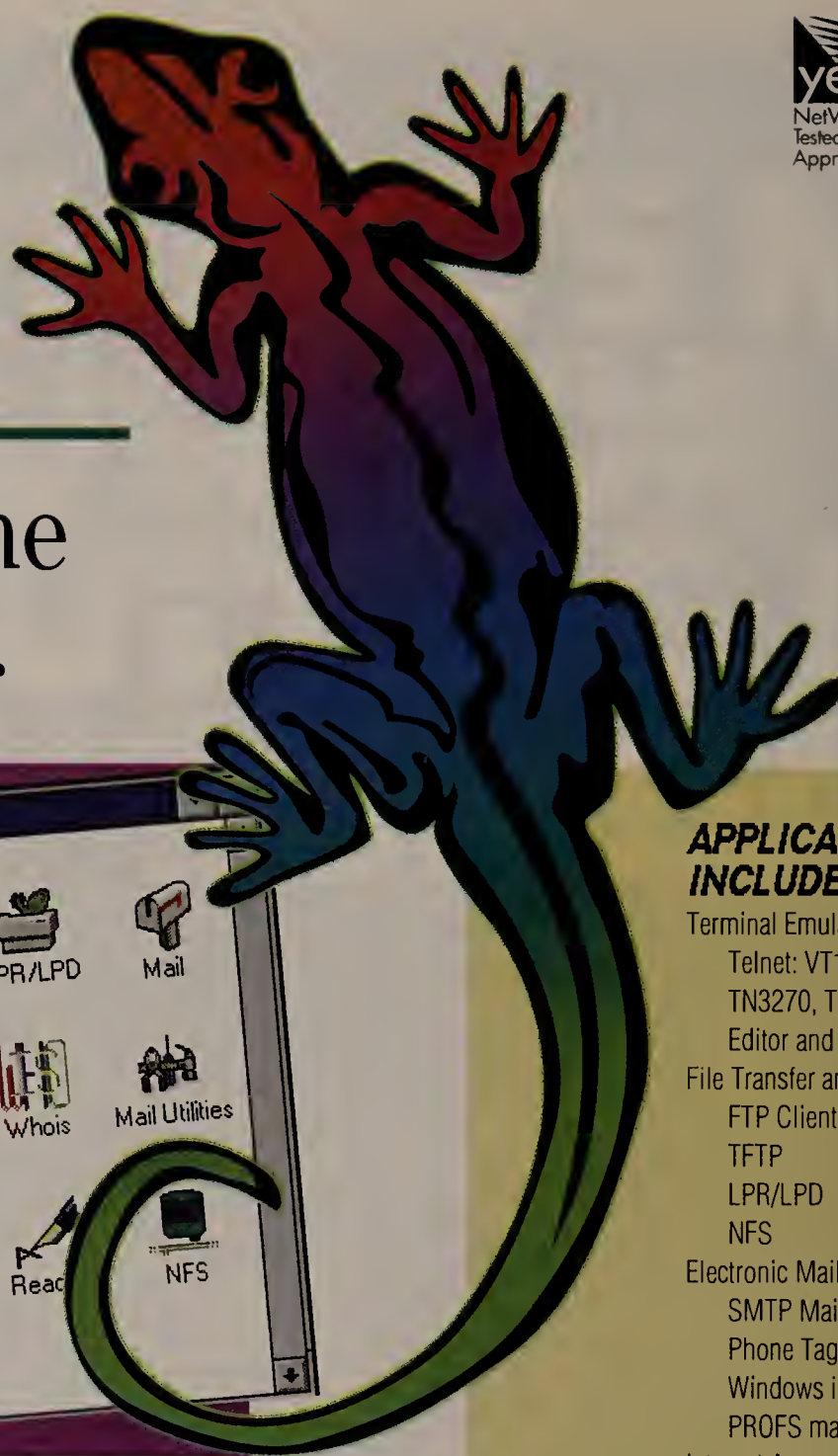


(800) 677-6899

MONDAY-FRIDAY 7AM-9PM CT • SATURDAY 10AM-6PM CT • SUNDAY 12PM-5PM CT
KEYCODE #11HS3 • CANADA* CALL 800-387-5755 • MEXICO CITY* CALL 800-228-7811

TCP/IP Applications For Windows.

Network Your PC To The World With Chameleon.



APPLICATIONS INCLUDED:

Terminal Emulation
Telnet: VT100, VT200, TVI, TN3270, TN5250, Visual Script Editor and Player
File Transfer and Printer Sharing
FTP Client and Server
TFTP
LPR/LPD
NFS
Electronic Mail
SMTP Mail with Mime
Phone Tag
Windows interface to IBM PROFS mail
Internet Access
Gopher
Newsreader
Whois
Network Utilities
Ping
Finger
DNS Client and Server
Networking Tools
TCP/IP Stack
Diagnostic Center/Trace
Agent
Custom

BEST VALUE.

Chameleon is a TCP/IP Windows software suite that offers more applications than any other product. It provides you with a comprehensive Windows solution for TCP/IP networking.

SEVEN INTEGRATED SOLUTION SUITES.

Chameleon includes seven integrated solutions suites: terminal emulation, e-mail, file and printer sharing, remote access network utilities, administration tools and an easy point-and-click interface into the Internet.

SEAMLESS ACCESS TO OTHER HOST SYSTEMS.

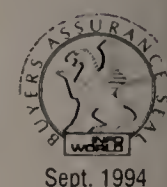
Chameleon includes more applications

that allow you to access information on Unix networks, mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

HOME, OFFICE AND REMOTE INTERNET ACCESS.

Take the hassle out of navigating the Internet with Chameleon's easy-to-use Windows interface. Access Internet resources anytime, anywhere. Search gopher space, read and post to news groups, download shareware, multi-media files and documents all with the click of a button.

NetManage Chameleon includes WinSock TCP/IP and is 100% DLL. Chameleon requires only 6KB memory and installs in just 5 minutes.



NETMANAGE™

(408) 973-7171

e-mail: sales@netmanage.com

World Wide Web: www.netmanage.com

Vendor scalability goals outstrip need

50,000-node capacity called 'kind of a great theoretical maximum'

By Steve Moore

■ Vendors are working feverishly to allow their network management systems to scale up to handle 50,000 nodes or more. But, who needs it? Few users operate on such a grand scale, and several customers said this capability is very far down on their wish lists.

"We're trying to walk before we run, and we don't have distributed applications running on everyone's desk yet," said Ron Welf, manager of performance and capacity planning at Charles Schwab & Co. in San Francisco. "Managing 6,000 nodes is the wildest projection I could imagine," he said.

"We're currently running about 5,000 [IP] nodes," said Paul Edmunds, senior information systems analyst at Duke Power Co. in Charlotte, N.C. He said he does not expect Duke Power's network to expand to more than about 12,000 nodes during the next few years.

Still, the vendors are persevering, and analysts said massive scalability is something some users consider when buying network management systems. Tivoli Systems, Inc. claims its Tivoli Management System can

support 50,000 nodes, and Hewlett-Packard Co. and Net-Labs, Inc. recently said their OpenView and NerveCenter systems can now work together to support 80,000 nodes.

But in the smaller networks operated by the majority of users, scalability represents more of a security blanket than an immediate procurement item. Although very few users today manage more than 10,000 nodes from one point, "they want to be reassured that they can do it if they have to," said Jill Huntington-Lee, principal consultant at Brandywine Network Associates in Cinnaminson, N.J.

Infinitesimal minority

According to Cheryl Currid, president of Houston consultancy Currid & Co., "Less than a tenth of 1% of networks in the world" need to scale to 80,000 nodes. She called that number "kind of a great theoretical maximum."

Other customers confirmed that notion. Ralph Tookey, senior communications system programmer at American Cyanamid Co. in Clifton, N.J., said if the networks of American Cyanamid and American Home Products are fully combined after the companies complete their impending merger, the number of managed

nodes will likely be below 40,000.

"Sufficiently distinct business functions may have completely distinct networks, and that may be a good thing," Tookey said. Cyanamid previously tied several of its own networks together but then found that users engaged in little real communication, he added.

"The real missing piece in network management has to do with people, not technology," Currid said. "The onus is on managers to invest in training so that more nodes can be managed per brain."

But vendors insist that if users want to manage bigger networks with fewer brains, they must invest in "intelligent" management systems that operate according to user-defined policies under which individual domains heal themselves and send only minimal traffic to a central console.

"The idea of distributing specialized intelligent agents is more cost-effective in the long run than having some big expert system at the top," Huntington-Lee said.

However, Tookey said, vendors' policy-based management schemes break down in extremely large networks because "there are bound to be exceptions to any rule when you scale up that large," and the number of exceptions can quickly become unmanageable.

"They want to be reassured that they can [manage more than 10,000 nodes] if they have to."

— Jill Huntington-Lee
Brandywine
Network
Associates

California county network employs the MIDAS touch

By Stephen P. Klett Jr.
NOVATO, CALIF.

Marin County in California has set up an Internet system that permits all public and private organizations to share information.

The new any-to-any network, called the Marin Information and Data Access System (MIDAS), is built around a countywide fiber-optic network consisting of a Fiber

Distributed Data Interface backbone connected to 3Com Corp. routers and SynOptics Communications, Inc. hubs. Wide-area access is provided by frame-relay services from Pacific Bell over mostly T1 and 56K bit/sec. leased lines.

Communication between Marin County and the outside world is conducted via the Internet. In fact, according to David Hill, project

manager at the County of Marin Data Processing Department, MIDAS was built on an Internet management model.

"Each organization is a node on the network that can communicate with any other node," Hill said. "We now have fields of interest brokering with each other that didn't before, and our goal is not to control the network but to let it grow and proliferate as needed."

Harmonic convergence

Participants say that in addition to improving communication, MIDAS has fostered a new level of cooperation and collaboration among disparate organizations not used to working with one another.

"Our way of doing business is changing. Schools and libraries are realizing it is no longer necessary to compete with each other and that collaboration can be fundamentally good for everyone involved," Hill

said. Another benefit, he added, is that Marin hopes to make itself more attractive as a location for new businesses.

In addition to a countywide electronic-mail system, MIDAS comprises the following:

- **Marin Libraries Consortium**, which provides all users on the MIDAS network with on-line database access to three city libraries as well as the county library.
- **Marin Cities and County Public Access System**, which provides dial-up and Internet users with access to schedules, agendas and minutes of city council and board of directors meetings. Sixty percent of Marin County residents have PCs at home.
- **Home Care Consortium**, which provides an automated registry of in-home workers to assist with personal care and household chores, coordinated by two government agencies and multiple private nonprofit agencies.
- **Marin Property System Title Company Access System**, which will create a special access menu for title companies to display on demand the property information needed for title searches.

MIDAS will also improve coordination. MIDAS, page 62

ON SITE

**Marin County
IS Department**
Novato, Calif.

Challenge: To provide universal, on-demand access to a countywide network for all public, private and nonprofit sectors.

Technology: Router-based internetwork with a fiber-optic backbone. Wide-area access provided via frame-relay services. Individual end points connected via low-cost, remote-office routers.

Result: New communication and collaboration opportunities provide new avenues for economic growth and education.



Key contributors to MIDAS are, from left, Bill Blackmer, Michael Groza and David Hill

KPMG turns to FirstClass groupware

By Lynda Radosevich

Like many of its Big Six consulting and accounting firm brethren, KPMG Peat Marwick is rolling out a corporatewide groupware system meant to help its professionals more efficiently share their expertise.

However, unlike its competitors, KPMG did not build its system on Notes. Rather, it is using FirstClass, a client/server groupware system from SoftArc, Inc., to create a unified front end for the various information sources.

KPMG is starting to roll out its massive in-house groupware system, dubbed Knowledge Manager, to 17,000 employees this month. The system allows KPMG personnel using Macintoshes or PCs to click on icons and access remote databases that contain, for instance, examples of successful proposals for floor space utilization.

Michael Donahue, a management consulting partner, said a pilot version of Knowledge Manager helped KPMG win a bid at a Northeast insurance concern. At 3 p.m. on a Friday in August, the insurer asked KPMG for a proposal for a major technology overhaul.

Four partners working in different cities collaborated

over the weekend using Knowledge Manager to gather background information, access graphics libraries and communicate. By noon Monday, they delivered a thick proposal to the insurer, complete with graphics and diagrams. In this case, KPMG won the account, beating Electronic Data Systems Corp., IBM and Coopers & Lybrand in the process, Donahue said.

Without Knowledge Manager, putting together such a proposal would have taken three to five business days — even pulling out all stops — he added.

"We want to deliver to every individual in the firm the combined intellectual global assets of the firm," said Allan Frank, managing partner at the enabling technologies division.

KPMG would not provide specific costs for the project but said FirstClass licenses cost roughly \$10 per user.

Notes alternative

Although KPMG recommends Notes to many clients, it was not suitable for KPMG's application, in part because of its proprietary database structure, according to Tony Ottavio, KPMG's chief information officer.

For instance, much of the company's information is contained in Microsoft Corp. Word, Excel and PowerPoint



KPMG's Allan Frank: Delivering intellectual assets to every individual in the firm

files on Novell, Inc. NetWare servers. To use Notes, the firm would have had to move the information in all those documents into Notes' proprietary databases using Lotus Development Corp.'s unique programming language, Ottavio said.

FirstClass enabled KPMG to build a front end that lets users see directories of various documents. Users can then upload selections by clicking on icons. Because the information remains in its native application format on a separate file server, KPMG is free to migrate from FirstClass to other groupware engines such as the forthcoming Microsoft Exchange server, Ottavio said.

Tom Austin, an analyst at Gartner Group, Inc., agreed that once a company builds code in Notes, that code is not por-

table to other platforms. "KPMG is betting that in two years, Oracle and Exchange will provide a better solution than Notes," he said.

KPMG began testing Knowledge Manager last summer with 1,400 users in the advanced technologies division in Radnor, Pa. Before the system was installed, professionals working on a proposal had to call around to find experts in the areas in which they needed information.

In preparing for Knowledge Manager, KPMG found that its largest technology challenge was building the underlying network support. The company runs both AppleTalk and IPX on all LANs and TCP/IP on wide-area connections. Diagnosing problems over the mixed-protocol network is problematic, Ottavio said.

ON SITE

KPMG Peat Marwick

Radnor, Pa.

Challenge: To create and maintain an electronic knowledge base that professionals in geographically dispersed areas can access.

Technology: Apple Computer, Inc. Quadra or Power Macintosh servers; Fiber Distributed Data Interface network with Cisco Systems, Inc. routers to connect wide-area LAN segments for remote dial-up; SoftArc's FirstClass bulletin board and conference software.

Results: Reduced the time and improved the quality of proposals.

TGV's onetime passwords evade intruders

By Gary H. Anthes

■ In a move to keep companies a step ahead of network hackers, TGV, Inc. in Santa Cruz, Calif., recently introduced Secure/IP, a token-based product for user authentication.

The software allows users to replace traditional passwords with onetime passwords that are useless if captured by would-be network intruders. It is used with portable cards, or "tokens," that generate the passwords. Users enter the password and a personal identification number to access a computer running Secure/IP on a TCP/IP network.

The U.S. Department of Energy's Oak Ridge National Laboratory in Tennessee is beginning to use the Secure/IP software — with tokens from Digital Pathways, Inc. — to secure hosts holding sensitive data. Some 200 users with privileged accounts on Digital Equipment Corp. VAXs and VAXstations will use the onetime-password technology, said Lawrence MacIntyre, a networkings specialist.

The VAXs represent a small portion of the 10,000 computers attached to the Oak Ridge network, and they are insulated from the Internet by firewalls. But the extra security is intended to safeguard the machines from un-

authorized access by internal users, MacIntyre said.

He said he also uses the technology to protect his own VAXstation. That enabled him to safely login to his computer from the Interop trade show in Atlanta recently, where an elaborate vendor network was set up and connected to the Internet. "It would have been suicide to use real passwords over that network," he said. "If there is any place your password is going to get sniffed, that's it."



Top security

"Token-based security is the most robust user authentication for networks available," said James Harrison, vice president of global networking strategies at Meta Group, Inc. in Westport, Conn. "It is fast becoming a critical component of the enterprise security architecture."

Secure/IP will be initially available for users of TGV's MultiNet version of TCP/IP for Digital's OpenVMS VAX and Alpha AXP computers. The client software will be included in MultiNet for Windows during the first quarter of next year. For VAX computers, the software costs \$1,000 to \$12,000, depending on the number of users.

Although MultiNet includes the Kerberos user-authentication technology developed by MIT in Cambridge, Mass., Secure/IP is better suited for groups that are highly distributed geographically, according to TGV.

"Kerberos is best for a small number of centrally administered workstations," said Craig Conway, TGV's president and chief executive officer. In larger companies, encryption key distribution "can be a big problem," he added.

Anil Khollar, a research analyst at City University of New York, said the university is experimenting with token-based authentication, including Secure/IP, for its network administrators. "We have an academic environment and all the problems associated with students trying to do funny things," he said.

Khollar said he worries about someone setting up a network "sniffer" to intercept unencrypted passwords coming into the 1,000-plus-node campus network. "If I was at a trade show or at some other university, I'd think twice about logging on via remote Telnet," he said. "So the alternative is to have a handheld token" to ensure an intercepted password cannot be reused.

The Secure/IP software works with major tokens such as Security Dynamics, Inc.'s SecurID, Digital Pathways' SecureNet and Belleore's S/Key software token.

Fast pace

TGV was ranked 40th on *Inc.* magazine's recent list of the fastest-growing private companies. TGV's sales have increased 4,023%, from \$357,000 in 1989 to 1993, when the company posted sales of \$14.7 million.

The TPC says our
servers have the best
price/performance.

D.H. Brown[®] says
we're #1 in single system
high availability.

And now IDC[®] says
we're the world leader
in medium-scale
UNIX systems.

How many more
reasons do you need
to put us on your
short list?

If you're so much as considering moving to a distributed environment, consider us.

Our open servers give you more of what you're looking for.

Leader in price/performance.

Like more horsepower. For less money. An area where our servers have traditionally come out on top.

And now even more so. In fact, the Transaction Processing Performance Council (TPC™) recently posted a record 1,649 transactions per second (tps-A)¹ with a cluster of our Model 3575 servers running AT&T LifeKeeper™ Fault Resilient Systems software.

Which means that at \$6,944 per tps-A, our clustered servers deliver the best price/performance in the industry.

Better than HP. IBM. Compaq.

Better than anybody.

Highest single system availability.

We didn't say it. D.H. Brown Associates® did. They evaluated six major UNIX-based high availability solutions.²

Here's what they found.

Ours provided the best single system availability. Beating out competitors like IBM, Digital, HP and Sun.

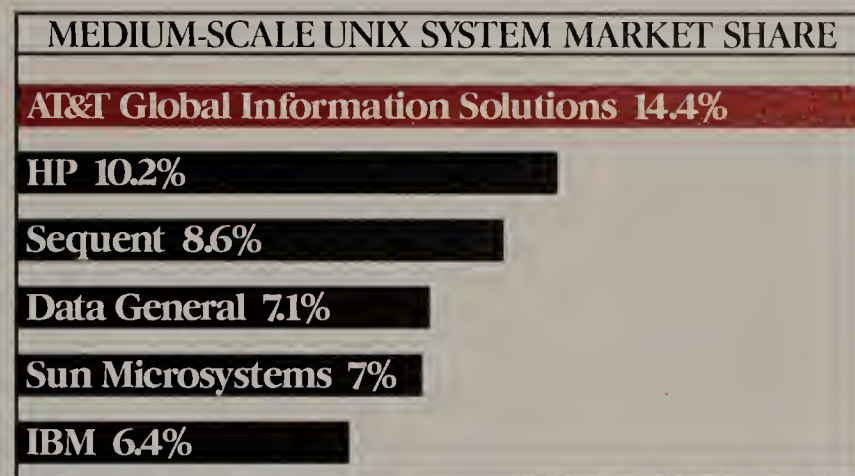
In the dizzying world of client/server, that could make all the difference. Between

a solution that saves you a bundle. Or one that costs you sleep.

#1 in medium-scale system sales.

We're not only the leader in server price/performance and reliability.

According to IDC, we're also the leader in medium-scale Unix system sales.³ With 163% growth last year alone.



Call us at 1 800 421-7942.

So if you're planning to move to a distributed environment, give us a call.

We'll send you our free Server Information Kit. With magazine excerpts and consultant reports.

And make sure you put us on your short list.

You'll be in good company.

¹TPC-A Benchmark Tests, July 1994. TPC-A, tps-A and TPC are trademarks of the Transaction Processing Performance Council.

²"UNIX Leapfrogs in Commercial Availability" ©1994 D.H. Brown Associates, Inc.

³"Unix Systems Market, 1993-1998" ©1994 International Data Corporation. © 1994 AT&T Global Information Solutions. All Rights Reserved.

**Distributed. Advanced.
Faster. Safer. Really.**

**GET IT.
move
USE IT.**

Now that NCR and AT&T are one, computing and communications have come together to help you get, move, and use information.



AT&T

Global Information
Solutions

Commentary

David Slater

Password panic

Are we on the threshold of an unforeseen crisis in the data processing industry? Is the message "MAX PASSWORDS EXCEEDED" flashing behind your retinas as you struggle to recall a password unused for too long? Is the future of civilization as we know it dependent on the frailties of human frailties — short-term memory? Take a minute and think about how many IDs and passwords you have to remember, not just in your job but in your life altogether.

There are more than you might expect, and if this password overload cannot be reduced to a manageable level, the economy is doomed.

Here are a few examples of the passwords I have to deal with on my current project:

- Corporate LAN identification and password.
 - Passwords on about five different Unix machines.
 - Corporate voice-mail password.
- Add to those the growing number of passwords to remember for both work and home, which include the following:
- ATM personal identification number.
 - Home and office voice-mail passwords.
 - Internet ID.
 - Miscellaneous on-line bulletin board services — CompuServe, local PC users' group, etc.
 - Database (Oracle, etc.).
 - Most business applications.
 - Long-distance service.

And there are undoubtedly others I can't remember right now.

Now what?

Just to make it more interesting, all these passwords have different requirements to remember if you must change them. These may include some or all of the following: that they be all letters or all numbers; that you do not use the ones you've used before back *n* number of times; that they contain a specified number of numerals or characters. Some never request that they be changed; others require change at 30, 60 or 90 days or some random interval.

Some people attempt to reduce memory overload by using the same password for all applications. Besides being a security nightmare, this solution has the unfortunate and time-consuming side effect of forcing you to change all your passwords every time you change one.

Infrequency of use is a serious

factor in password forgetfulness. If I haven't used a password in more than 30 days, the likelihood of my remembering it on my own is no better than a toss-up, or 50-50. Human short-term memory degrades rapidly until the short term expires, somewhat like the date on a milk carton, at which time the information is no longer available or recoverable.

How about lost productivity in time spent resetting forgotten or otherwise lost passwords? At some point, the rising curve of lost time (not to mention corporate resources dedicated to keeping track of security) will intersect with the falling curve of productivity. As the number of passwords rises, time spent trying to remember or reset passwords will exceed actual productive time and the economy will grind to a halt.

- What are the solutions?
- We could eliminate all passwords. This still leaves user IDs to remember, but it would reduce the load greatly. But this idea would make those in charge of security very nervous and unemploy a significant number of people.
 - Create for each person a unique global password that would be easy to remember and would work for all systems. This is probably the most sensible approach, which makes it the least likely candidate. And it still requires the individual to remember a password.
 - Create one universal password for all. The appearance and aura of security would be maintained, and security people would remain employed. The likelihood of forgotten passwords would plummet and approach, but not quite reach, zero — if you forgot it you could just ask the person next to you.
 - Bypass human short-term memory by implanting a uniquely identified biochip on which passwords are encoded and that could communicate with any system. This might work similarly to the military's IFF (Identification Friend or Foe) system, with an exchange of signals. Still well in the future, but a likely scenario.

Are we approaching password panic? That seems to be the trend. Yesterday I received notice that one of my credit cards now has a personal identification number for me to add to my list of passwords. Oh well.

Slater is a design architect at Productive Data Systems in Denver. He can be reached via CompuServe at 72610,131.

Briefs

1490 group assembles

A group of internetworking product vendors has formed the **1490 Market Development Group**. Request for Comment 1490 discusses the running of multiple protocols over frame relay, and the aim of the group is to build awareness in the marketplace for an alternative in SNA and LAN internetworking. This will be done through a number of market programs such as seminars, white papers and speaking engagements. The group will not attempt to offer advice to specific users on products and strategy.

25M bit/sec. picks up steam

25M bit/sec. Asynchronous Transfer Mode (ATM) technology received yet another boost with the recent announcement of the formation of **Whitetree Network Technologies, Inc.**, which will sell workgroup products based on 25M bit/sec. ATM. In addition, **Madge Networks, Inc.** has partnered with Whitetree, a Palo Alto, Calif., start-up, to develop 25M bit/sec. ATM products. The two companies join **First Virtual Corp.** in focusing solely on 25M bit/sec. ATM. Whitetree also spearheaded the recent formation of the Desktop25 ATM Alliance with IBM.

Oracle sniffs out performance

Network General Corp. and **Oracle Corp.**

have announced a technology agreement under which Network General's Sniffer products will be used to help optimize the performance of Oracle databases across networks. Using protocol decodes and analysis, the companies aim to enable users to determine whether database performance problems are attributable to the client application, the network, the server or the database. The new capabilities are slated to become available next year.

At-home shopping planned

Digital Equipment Corp. will join with **MicroMall, Inc.** to build at-home interactive shopping environments for retailers. MicroMall will provide an electronic-mall framework, and Digital will provide the video server technology and media studio resources. **Land's End, Inc.** was the first company to sign on.

IBM unveils second ATM phase

IBM has rolled out its second phase of Asynchronous Transfer Mode (ATM) products. The company has unveiled an ATM backplane and ATM modules for the IBM 8260 intelligent hub; an ATM LAN bridge that lets users add ATM to their current Ethernet or Token Ring networks; and ATM Campus Manager for AIX, which lets users manage ATM networks in a campus environment. In June, IBM rolled out wide-area ATM switches, adapters and LAN emulation software.

MIDAS

CONTINUED FROM PAGE 57

nation among county criminal justice systems. It will, for example, electronically transfer criminal justice photographs from the cities of Novato and San Rafael to the Marin County Sheriff's and District Attorney's offices.

While MIDAS brings together the public and private sectors, it also ensures that nonprofit organizations are not forgotten as the county merges onto the emerging information superhighway.

"People have been afraid that nonprofits will be shut out of the information superhighway. We have guaranteed there will be more than one nonprofit lane," said Michael Groza, direc-

tor of community programs at the Marin Community Foundation in Larkspur, Calif.

Hill, Ben Dresden, director of information services and technology, and Bill Blackmer, senior information support analyst, are the principal information systems architects overseeing MIDAS.

Far apart

Before the hardware and cabling infrastructure for MIDAS was completed last month, the myriad independent public and private networks in the county might as well have been on opposite sides of the world, not down the street or across a city, when it came to sharing information.

"Before MIDAS, we didn't have a sophisticated network by any stretch of the imagination," Dresden said.

Back to school

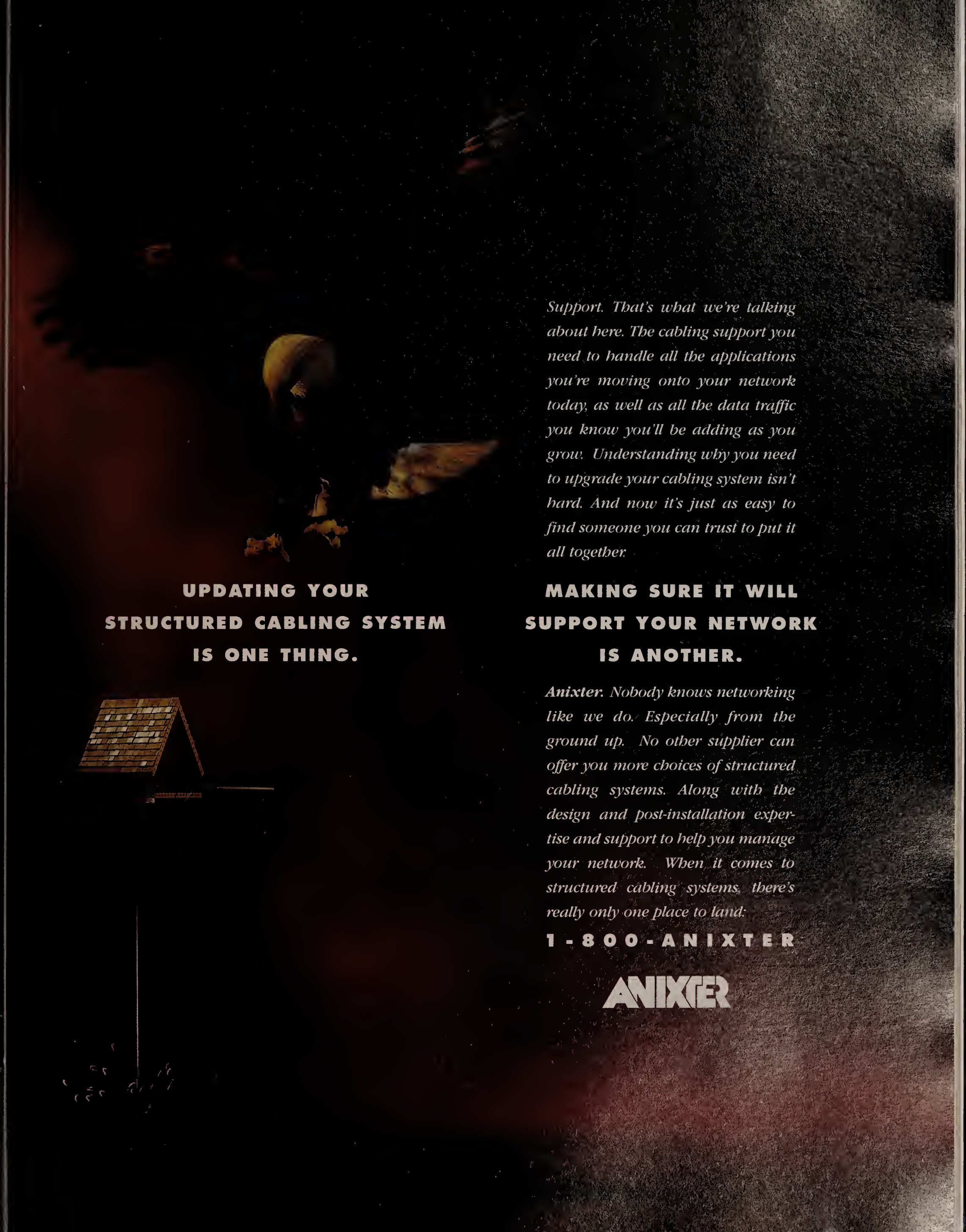
Marin County's schools perhaps stand to reap some of the biggest benefits from MIDAS, and many are buying computer equipment this year instead of football equipment, according to David Hill, project manager at the county's data processing department.

For example, the Novato school district alone has earmarked \$500,000 for technology investments to install LANs and computer equipment to connect to MIDAS.

Michael Groza, director of community programs at the Marin Community Founda-

tion in Larkspur, Calif., said the Marin library network will likely be extended to include other Bay Area libraries and eventually even the Library of Congress. In addition, students will be able to browse the vast resources on the Internet as well.

The county is also banking on heavy use of multimedia applications for education, which MIDAS will be able to support. For instance, Hill said he envisions specialized courses on the Civil War with point-and-click interfaces comprising video, voice and textual data. — *Stephen P. Klett Jr.*



**UPDATING YOUR
STRUCTURED CABLING SYSTEM
IS ONE THING.**



Support. That's what we're talking about here. The cabling support you need to handle all the applications you're moving onto your network today, as well as all the data traffic you know you'll be adding as you grow. Understanding why you need to upgrade your cabling system isn't hard. And now it's just as easy to find someone you can trust to put it all together.

**MAKING SURE IT WILL
SUPPORT YOUR NETWORK
IS ANOTHER.**

Anixter. Nobody knows networking like we do. Especially from the ground up. No other supplier can offer you more choices of structured cabling systems. Along with the design and post-installation expertise and support to help you manage your network. When it comes to structured cabling systems, there's really only one place to land:

1-800-ANIXTER

ANIXTER

A COMPARISON BETWEEN OUR NEW CORPORATE PC AND THE COMPETITION'S.



OOPS, WE FORGOT. THERE IS NO COMPETITION.



CORPORATE STANDARD REQUIREMENTS

75MHz PENTIUM PROCESSOR	✓
3-YEAR LIMITED WARRANTY*	✓
ISA/PCI	✓
PLUG-N-PLAY AND CHICAGO READY	✓
ENERGY STAR COMPLIANT	✓
GUARANTEED COMPATIBILITY*	✓
ISO 9002 QUALITY	✓

Sure, you could go out and buy yourself a Pentium™ processor-based system. Hey, it may even be Chicago ready. But can it meet everything else on your corporate standard list?

Guaranteed compatibility? Energy Star compliant?

Probably not. Dell is the only personal computer company making a Pentium processor-based system that meets the key requirements corporations tell us they need.

Actually, we've gone a little farther.

Not only does our OptiPlex™ XL 575 meet all the above requirements, it has



PCI-Enhanced IDE, auto power-on, 64-bit video, and costs less than \$2000.

So stop wasting time and money waiting for a system that meets your standards. The new Dell® OptiPlex XL is the first Pentium processor-based system that's right for corporate America.

DELL OPTIPLEX XL 575 PENTIUM PROCESSOR 75MHz SYSTEM

8MB RAM/340MB HARD DRIVE
VSI4 COLOR MONITOR
(14" CRT, 28mm)

\$1999*

BUSINESS LEASE⁶: \$74/MO.
ORDER CODE #300251
(90MHz SYSTEMS ALSO
AVAILABLE)

DELL™

To Order, Call

800-225-4916

In Canada, Call 800-387-5755

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm CT
In Mexico City, Call 800-228-7811. Keycode #11HS5

*If you encounter a compatibility problem within three years after the original purchase, we guarantee that Dell's engineers and technicians will work with you to identify the cause and recommend a solution. For a complete copy of our limited compatibility guarantee, contact Dell at 1-800-933-4177. Guarantee applies to PC hardware only and does not extend to software or devices not intended to run on comparable ISA or EISA systems of the same vintage. *Non-discountable promotional price expires 12/31/94. Prices valid in U.S. only. Some products and promotions not available outside the U.S. Prices and specifications subject to change without notice. The Intel Inside and Pentium Processor logos and Pentium are trademarks of Intel Corporation. ⁶Business leasing arranged by Leasing Group, Inc. ⁷For a complete copy of our Limited Warranty, please write Dell Computer Corporation, 2214 W. Braker Lane, Bldg. 3, Austin, TX 78758. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

Parallel processing

PNC Bank profits from parallel system

By Thomas Hoffman

With an expanding loan portfolio that earlier this year was approaching 750,000 accounts, PNC Bank had to push its IBM mainframes hard in the wee hours to update customer files for its tellers and customer services representatives by the next business day.

Starting at 15% to 20% annual growth of its loan portfolio, the Pittsburgh-based bank had to do something to increase the capacity of its host systems. To help streamline its processing and provide ample room for future growth in its loan portfolio, the bank, which reported \$64 billion in assets last year, recently implemented a parallel processing system that divides the workload among its IBM ES/9000 mainframe processors.

Help wanted

In the past 10 years — through a combination of corporate acquisitions and in-house development — PNC amassed 27 different loan accounting systems. In the past three years, PNC consolidated these into a single corporate system, but the IBM 3070 and 3090 mainframes used to batch-process customer data each night were struggling to keep up.

"We were really hitting the threshold of how much processing we could do with one system," said Bill Harnish, group vice president and MIS manager of PNC's consumer credit systems, of the batch processing that occurred between 9 p.m. and 5 a.m.

Early this year, PNC's technical staff and consulting partner American Management Systems, Inc. (AMS) divided the bank's loan files into four parallel segments. To support the initiative, PNC logically partitioned its AMS Advanced

Consumer Loan System databases to run concurrently on its three IBM ES/9000 mainframes over IBM's MVS/ESA operating system.

PNC assigned one of its information systems staffers and an AMS consultant to design the parallel processing system over a four-month period. Four additional staffers implemented and tested

the system during the next four-month phase. Harnish estimated the eight-month project cost \$140,000, including consulting services and programmer time.

Making gains

After completing the design of the parallel processing environment, PNC began running the new systems in March. Although Harnish said it is still too early to quantify the cost savings, he did point to several productivity gains.

For example, before the parallel processing environment, PNC chewed up two hours of CPU time to add a new set of loans to the system. Under the parallel architecture, these loans can now be entered in 30 minutes.

By shifting to parallel processing, PNC has reduced the time needed to update its loan portfolio and do its general ledger and other reporting from four hours to 1½

hours.

PNC's parallel processing efforts are on the cutting edge of what banks are doing with host systems today, according to one analyst. "There is a lot of talk about parallel processing in banking today, but little has been done due to the heritage and emotional commitment banks have to their mainframe-centric legacy applications," said Richard Crone, senior manager of financial services at KPMG Peat Marwick in Los Angeles.



PNC Bank's Bill Harnish: System reduced processing times

Projected growth

PNC's parallel processing systems should enable it to expand its loan portfolio from 900,000-plus accounts to 3 million accounts, said Bill Harnish, group vice president and MIS manager of PNC's consumer credit systems.

Replication falls short

Database vendors split on strategies but promise relief

By Kim S. Nash

Replication — the act of automatically copying and synchronizing databases in different locations — is key to enterprise client/server users who want to run database-intensive applications across remote sites.

But users beware: The major database players approach replication differently and to varying degrees.

And products for managing replication tools, like those for monitoring client/server applications, are sorely lacking, said Judy Davis, an analyst at Hurwitz Consulting Group, Inc. in Watertown, Mass.

Computer Associates International, Inc.'s Ingres/Replicator manager, for example, is character-based and not integrated with Ingres' other systems management aids. Informix Software, Inc. lacks any replication management products whatsoever. However, Sybase, Inc. does offer both Motif and Windows replication managers.

Up and coming

"It's not a very mature technology yet, but it'll heat up next year. Right now, the players are all over the map in terms of what they support and what they don't," said Bobby Cameron, an analyst at Forrester Research, Inc. in Cambridge, Mass.

The replication scene should become more coherent between now and mid-1995 as Microsoft Corp., Oracle Corp. and others release promised products. Oracle, for example, plans to add conflict resolution and graphical utilities for managing the process to the relatively basic replication capabilities of its Oracle 7 database. The features are in beta testing now and are due out in the first quarter of next year in Oracle 7 Release 7.2.

Ingres/Replicator, which CA inherited in a May takeover of The ASK Group, Inc., is probably the most muscular replication offering now available, Cameron said. But if Oracle fulfills promises it has made during the past year, it will catch up fast, he said.

Sybase has perhaps the best-known offering in this area, Replication Server. In fact, Replication Server helped drive the Alberta Ministry of Labour's decision in July to pick Sybase's database over Oracle's for a sizable mainframe downsizing project, said Erv Krawchuk, director of systems at the Edmonton, Alberta, agency.

The Ministry needs to keep 17 sites in sync

across the province, tracking information such as which construction companies have permits to work on what tracts of land or whether contractors have approval to replace gas, electricity or plumbing equipment.

Replication Server requires Replication Server Monitor to watch and troubleshoot problems — a situation some users said they consider just one more add-on product that costs money. However, Sybase offers more advanced replication management utilities than

Database dilemma

Users dislike two-phase commit as a way to link separate databases partly because Oracle, Sybase and other major vendors have different and complicated ways of implementing it

HOW WILL YOU COORDINATE SEPARATE DATABASES?

Two-phase commit	1
Remote procedure calls	3
Replication	13
Gateways	14
Other	5
Don't know	15

Base: 50; multiple responses allowed

Source: Forrester Research, Inc., Cambridge, Mass.

other database makers, Cameron said.

One element users said they want is the ability for a database to replicate to and from databases from competing companies. Right now, replication to rival databases is done via gateways and other middleware products. And that communication is only one-way.

For example, if Oracle is the master database, it can throw data out to non-Oracle databases, but it cannot receive information from those remote databases.

Promises, promises

Sybase has promised to ship two-way replication between Sybase's System 10 and IBM's DB2 by the end of the year. IMS and VSAM will follow during the first quarter of next year, said Mike Forster, president of Sybase's MDI gateway subsidiary.

Microsoft has vowed to add replication features early next year to both its SQL Server 95 database and the Windows NT operating system it runs on. SQL Server 95 is due out in January.

Those promises had better be kept, said Harley Arnett, chief information officer at Foster Ousley, Conley, a mortgage appraisal firm in Walnut Creek, Calif.

Replication would let the company keep a continuously updated copy of a given database rather than do nightly backups to a hot server, Arnett explained. The entire com-

Replication, page 69

The other guys

- Software AG of North America, Inc. offers a replication add-on for its database that updates distributed systems at preprogrammed intervals for individual transactions rather than force the system to copy an entire database.
- Praxis Instruments, Inc. plans to ship during the first quarter of next year Omni Replicator, a product that replicates data between heterogeneous databases.

Industry groups fight IBM moves

Leasing firms ruffled by challenge to decree

By Mark Halper

It is 1994, IBM's hammerlock on the computer industry has loosened to a pinch, and yet a group of trade associations representing an expanse of computer and communications companies are voicing antitrust concerns.

While that may sound anachronistic to some, it does not to hundreds of companies providing outsourcing, services and equipment leasing in competition with IBM. The focus of their worries is IBM's effort to terminate a 38-year-old antitrust provision — the 1956 Consent Decree — that restricts IBM's service and leasing practices.

Rivals take action

The latest opposition to IBM's efforts comes from CDLA: The Computer Leasing & Remarketing Association, formerly known as the Computer Dealers and Lessors Association. On Oct. 18, the CDLA filed a motion with the U.S. District Court of the Southern District of New York noting it intends to intervene in the case [CW, Oct. 24].

IBM, after several years of keeping a low profile amid complaints that its outsourcing business violates the decree, went on the offensive last June in the same court seeking to abolish the U.S. Department of Justice agreement [CW, June 13].

Industry groups such as the CDLA, while acting for members' self-preservation, point out that an unleashed IBM could have an unfortunate impact on users be-

cause it would put some service companies out of business. Customers would have fewer service providers from which to choose and could be forced into the medieval computing practice of having to buy services and product from the same vendor, the groups said.

"The interests being represented here are also the interests of end users, who want to get the best prices available," CDLA President David Poisson said last week about his association's filing.

IBM does not see the future that way at all. It claims that it could provide users with better prices if it were freed from the restrictions imposed by the Consent Decree.

In its June filing, IBM noted that "in the 38 years since the decree was entered, there have been significant changes in circumstances that warrant termination of the decree" and that "IBM's position in the relevant industry has changed markedly from 1956 to today."

Some industry legal observers agree with IBM.

"There are a lot of people who no doubt have legitimate concerns about IBM being able to subsidize their outsourcing business, credit business and equipment business, but [IBM is] no longer the dominant force in any of those," said Jay Westermeier, a Washington-based attorney with Fenwick & West in Palo Alto, Calif.

Westermeier pointed out that alliances such as IBM's pact to work out a common PowerPC platform with Apple Computer, Inc. and Motorola, Inc. underscore IBM's fall from dominance because IBM

Industry groups opposing IBM's efforts		
Association	Number of members	Members include
CDLA: The Computer Leasing & Remarketing Association, Washington	260	• EDS Financial • AT&T • Comdisco • El Camino Resources
Computer & Communications Industry Association, Washington	36	• Hitachi Data Systems • Amdahl • Tandem Computers • Unisys • StorageTek • Sun Microsystems • Several Baby Bells • AT&T • Northern Telecom
Independent Service Network International, Atlanta	Approximately 250	• Bell Atlantic

is turning to its competitors to help overcome Intel Corp. and Microsoft Corp. forces.

Gary Reback, an attorney with Wilson, Goodrich & Rosati, also in Palo Alto, pointed out that opposition to IBM should nevertheless be taken seriously. A recent U.S. Supreme Court ruling in a case brought against Eastman Kodak Co. established the validity of independent service companies making claims against service controls exerted by product suppliers, Reback said.

The CDLA's opposition marks at least the third industry group to attempt to intervene in the case. In August, the Computer & Communications Industry Association filed a similar motion [CW, Aug. 22], and

Close ties

The Consent Decree case is currently embroiled in IBM's efforts to remove Judge David Edelstein. Judge Edelstein has been presiding over the decree since it was written in 1956 and has had a combative relationship with IBM as the judge in the U.S. government's unsuccessful antitrust action against IBM in the 1970s and early 1980s.

before that, the Independent Service Network International (ISNI) also filed in defense of its members' interests (see chart).

Poisson said the CDLA is concerned that without the Consent Decree, IBM would be free to revert to its practice of 40 years ago of providing users with lease-only access to its equipment.

That would give IBM monopoly control of the leasing business because it would deprive today's leasing companies of the right to purchase and then lease IBM equipment, he said. If IBM gets what it wants, it might also gain the right to buy back equipment from third-party lessees once leases expire, Poisson said.

Some silent, some loud

A few firms have been outspoken in their opposition to IBM. Storage Technology Corp. in Louisville, Colo., is among them, as is Dallas-based outsourcer Affiliated Computer Services, Inc. and Wayne, Pa.-based disaster recovery firm Sungard Data Systems, Inc.

Most individual companies have chosen to keep their Consent Decree opinions to themselves. A spokesman for Hitachi Data Systems Corp., for instance, last week said his company would have no comment, although HDS has assigned a senior vice president, James Doody, to the matter.

Claudia Betzner, executive director of ISNI, explained the relative silence.

"You don't get a lot of people being vocal because they still want to keep good relationships with IBM," she said. "They still buy parts and products from them."

Cadis gives parts management another try

By Rosemary Cafasso

These days, Cadis, Inc. is hoping for second chances.

In the early 1990s, the Boulder, Colo., company, then known as Cadis Information Systems, bombed out as a provider of services and PC-based data management software to manufacturing companies. But last week Cadis took another shot and began shipping Parts Management Expert (PME), a new software package that uses a client/server design and provides data storage and management as well as high-level search capabilities.

The firm is again targeting manufacturing companies and will try to address a critical user issue: getting a handle on managing the thousands of different parts and parts numbers that often live in different systems.

So far, initial users are giving the effort a thumbs-up. Joe Kartje, an artificial intelligence consultant at Navistar International Transportation Corp. in Chicago, said his staff had given

up on finding a parts management system to replace a proprietary data retrieval system.

"Then the Cadis literature came across the desk," Kartje said. "This fills a definite need."

Vencat Mohan, Cadis' president, said PME carries forward the concept of parts management the company initially tried to market as a services offering.

PME still requires up-front work on Cadis' part. The company scans a customer's data files and retrieves parts numbers. But once PME is loaded with customer data, users can retrieve information with front-end software that uses a point-and-click format.

Complex system

Parts management is often a critical and expensive issue at manufacturing companies, where it is not uncommon to see the same part listed under different parts numbers in different systems. With inefficient retrieval systems, it is easier for a user to create a new part — and duplicate a previous effort — than to go



Fresh start

Cadis' restart comes after \$6 million in new venture money and a completely new management team. Of the 25 employees at the company today, only one remains from the original company.

through a difficult search process.

Because of all the extra work and redundancies maintained, it is not unusual for each part number to represent several thousand dollars in annual costs for a manufacturer.

In Navistar's case, the company had about 60,000 different parts located in different systems, Kartje said. Each individual part cost about \$5,000 per year to keep. Kartje said that with the PME product, his staff can organize and group similar parts.

Kartje said he expects Cadis will reduce parts search time from 30 minutes to five minutes. He also said he expects it will reduce the number of new parts generated by 5% to 10% because people will be able to find parts in the new Cadis system instead of having to create new parts.

Users can search by selecting attributes of a part rather than using the actual parts number.

PME runs on Unix servers and supports desktops that run on Windows and the Open Software Foundation's Motif.

Pricing will range from \$50,000 to \$500,000, depending on the configuration and the extent of up-front services required.

MAKE YOUR BUSINESS

UNSTOPPABLE



What would happen if your business was stopped dead by computer failure?

You'd run a big risk of losing customers and revenue.

That's why we suggest you consider the advantages of a total availability computer system from Sequoia.

ON-LINE. ALL THE TIME.

Our Unstoppable Technology™ ensures the constant availability of even your most complex on-line business applications.

Our on-line diagnostics find and correct any potential problems. And our Unstoppable Service™ stands by you 24 hours a day, seven days a week.

The result is that the information you need to serve your customers better is always available.

FAULT TOLERANCE IS JUST THE START.

Our open systems UNIX® solution will meet your needs for years to come. We also have symmetrical multiprocessing, and the only fault-tolerant multi-instance ORACLE® with parallel server.

We cost much less than you think. In fact, you can buy just what you need now, and then easily add more power as needed. Which makes us a smart buy for even small, fast-growing companies.

Call Sequoia today at 1-800-562-0011. Ask for our free white paper *12 Ways to Make Your Business Unstoppable*. And get ready to bust loose.

Total Availability Solutions™

Our uninterrupted computing capabilities, data integrity, and on-line expandability can make your business unstoppable.

SEQUOIA

Teleport dials up client/server

By Kim S. Nash

Making client/server work isn't the result of one sweaty, do-or-die decision made in the depths of a data center. Client/server success creeps up slowly, a matter of a million everyday choices.

And Teleport Communications Group knows it.

The New York telephone company has spent the past five years migrating from Digital Equipment Corp. host-based information systems to a distributed scheme spread over 19 cities and based on Sun Microsystems, Inc. hardware. And in the midst of the project, Teleport had a database change of heart, switching from Oracle Corp. to Sybase, Inc.

"Client/server turned out to be our direction, but when we started we just were looking for technology that worked for us," said Patrick Socci, vice president of information services.

System switch

Teleport's transformation involved moving from a combination of Digital's flat-file RMS databases and Oracle's relational databases on Digital VAXs to Oracle on various Unix machines. But when data volume grew to 25G bytes, the

Teleport Communications Group	
Challenge	Speed up processing times as data volumes grow beyond 25G bytes, monitor client/server activities
Major technology	19 Sybase SQL Server databases, Sybase Replication Server, six six-processor Sun servers
Results	Faster processing, ability to better troubleshoot problems such as I/O bottlenecks, downed networks and database crashes

system started huffing and puffing, Socci said, and the company began swapping out Oracle for Sybase.

Order processing, equipment inventory and other customer service applications slowed down as Teleport started to serve more territories, he explained. The company provides dial tones primarily for businesses in 19 U.S. cities, including San Diego, Seattle, Chicago, Boston and New York.

Teleport's then-parent company, Merrill Lynch & Co., decided to standardize

on Sybase's SQL Server for several reasons, Socci said. SQL Server offers a smoother, faster architecture and is easier to use than Oracle, he said.

End users now have faster access to database information, said Emilio Portelli, Teleport's director of engineering for New York City.

For example, reports summarizing data on customers waiting for phone service on a given day used to take an hour or more to process under Oracle, Portelli said. But Sybase, combined with more efficient hardware, gives him "instantaneous access," he said.

The switch to Sybase then led Teleport to its next decision: new hardware. The firm chose Sun's SPARCstations and SPARCservers to replace Unix and proprietary boxes, mainly as a result of Sybase's priorities. At the time, Sybase consistently brought out fresh releases and new products on systems from Sun before any other hardware.

Now all operating applications—from order processing to phone service installation to network monitoring—run on Sybase SQL Server Version 4.92, accessed by 700 users nationwide. Custom-

er billing, the only application that remains on a Digital VAX running Oracle, is due to be migrated sometime next year.

Socci and his IS team negotiated a deal with Sybase that lets Teleport run SQL

Server on whatever hardware it wants for a single price. Usually, database makers bill users for moving licenses to hardware not stipulated in the contract or charge different prices for different platforms or operating systems.

"The only weakness we find now with Sybase is lack of availability of tools," Socci said, "but Sybase is committed... to fill that void." So sure is Socci that Sybase will deliver on promises to ship its already-late Build Momentum development tool kit before the end of the year that he recently held off on buying similar products from Powersoft Corp.

His reasoning? Regardless of when they ship, Sybase's tools will no doubt be more integrated with the Sybase database than any other tools could be.



Teleport's Patrick Socci: SQL Server is smoother, faster and easier to use than Oracle

THERE'S AN OMEGAMON[®] FOR STORAGE.

OMEGAMON II[®] FOR SMS



Your critical data depends on expensive and growing storage resources like cache and DASD. That's why...

THERE'S AN OMEGAMON FOR STORAGE.

OMEGAMON II FOR SMS



New Products

Boole & Babbage, Inc. has announced Command/Post Connect MVS, a mainframe interaction enhancement product.

According to the San Jose, Calif., company, Command Post Connect MVS tightens integration among MVS host systems and other computer and network equipment and applications managed by Boole & Babbage's Command/Post product.

The product automates the MVS master and service processor consoles and processing, performs host heartbeat checking and provides remote console support.

Command/Post Connect MVS costs \$5,000.

► **Boole & Babbage**
(408) 526-3000

Product short

Genesys Software Systems, Inc. has announced the Genesys Enterprise Series for Sybase's SQL Server 10, a client/server human resources, benefits and payroll application for open environments. The product is based on a three-tiered client/server architecture and runs on Sun Microsystems, Inc.'s SPARC-based computers. Cost: Starts at \$125,000. Genesys Software Systems, Methuen, Mass. (508) 685-5400.

Replication

CONTINUED FROM PAGE 65

pany runs on 12 copies of SQL Server and 18 Windows NT Advanced Server machines, he said.

Informix has thus far shied away from full-blown replication, although its Informix-OnLine and Informix-SE databases do allow some comparatively rudimentary database copying.

Among the differences users should watch for are options for incremental

replication, Davis said. Oracle and IBM offer the choice of replicating a full table or database or just the information within that table or database that has changed. Sybase does not.

Another differentiator is push vs. pull replication. IBM uses pull replication where remote sites seek out data they want from a master server. Sybase, meanwhile, uses the push approach, which calls for a master to shove changed data through the network to remote sites. Push replication allows event-driven replication. Pull replication produces less network traffic.

Briefs

HR software released

Software 2000, Inc. formally introduced object-oriented human resources software for client/server users with the AS/400 after starting beta testing in September [CW, Sept. 26]. The Infinium:HR software supports Windows and OS/2 clients and is scheduled for general availability by year's end, with prices starting at \$56,000 for the server code and \$1,500 for client licenses. The human resources package will be followed by an Infinium financial series that should be ready for beta testing in mid-1995, Software 2000 said.

IBM seeks buyer

IBM said it is looking for a buyer for all or part of its Havant, England, disk drive plant, which already markets manufacturing services to other companies. A management buyout is among the options being considered.

Acquisition completed

Cray Research, Inc. completed a \$10.4 million acquisition of the **Minnesota Supercomputer Center, Inc.**,

a research facility previously owned by the University of Minnesota. The center will continue to operate with most of its current employees, Cray said.

Into the fray

The client/server applications market may be chock-full of players, but that did not stop **Global Software, Inc.** from officially jumping in. The mainframe accounting software company, which has built up a base of about 750 customers since the 1970s, announced it will sell the Universal Series client/server financial software from UK-based **Quality Software Products Ltd.**

Storage market expands

Cambex Corp., which currently sells mainframe memory boards and disk arrays for IBM's RS/6000 Unix systems, said it plans to ship a cached array for mainframes during the first half of next year. A redundant arrays of inexpensive disks Level 5 subsystem will be added later, although Cambex officials would not say when that product will be available. Cambex claims to have sold more than 100 of its RS/6000 arrays, mostly for use with high-end commercial servers.

Another thing.

It's the first realtime monitor that looks at storage resources from every angle—space, performance, even SMS and HSM—all in one product. So remember...

THERE'S AN OMEGAMON FOR STORAGE.

OMEGAMON II FOR SMS



One last point.

You can see how critical applications use and compete for storage down to the dataset level, both SMS and non-SMS volumes. And it's an integral part of Candle's unique availability management solutions. But all you really need to know is...

THERE'S AN OMEGAMON FOR STORAGE.

OMEGAMON II FOR SMS

For the complete storage story, call 1-800-843-3970.





The kind of growth path you'll be on
with our new PowerPC SMP servers.

Future PowerPC 604 processor upgrade at no charge

Binary-compatible members of the IBM RISC System/6000® family, extending to the Scalable POWERparallel™ SP2

There is a
difference.

Actually, "growth Autobahn" may be a more precise description of the first of a new generation of servers that run AIX®, IBM's version of the UNIX® operating system. These servers bring mainframe-level reliability to open computing, putting you on a growth path that's virtually infinite.

At their core is IBM's symmetric multiprocessing (SMP) architecture, harnessed to the PowerPC™ processor. With SMP, you can add PowerPC CPUs as your needs grow, starting with two and expanding up to eight. You can even upgrade to higher-performing PowerPC chips in the future.

Our SMP isn't just built for growth. It's also built for speed.

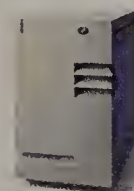
Unlike in other servers, memory access bottlenecks have been minimized. Each microprocessor can access memory concurrently without waiting. That's supercomputer-level capability.

Our servers also deliver reliability others don't. (That's part of our obsession with guarding your business-critical data.) With IBM SystemGuard™, an independent service processor automatically brings you back online if processor, memory, software, disk errors or power failures occur.

All these mainframe capabilities come in machines that run AIX. So networks can run everything from

engineering and accounting applications to databases such as DB2/6000®, INFORMIX®, INGRES™, ORACLE®, PROGRESS® and SYBASE®.

If this is the path you want to be on, you can get more information through the Internet via IBM's Worldwide Web server at www.ibm.com, or call your IBM representative, IBM Business Partner or 1 800 IBM-6676, ext. 621.



THE NEXT-GENERATION
RISC SYSTEM/6000
SMP SERVERS FROM IBM

RISC System/6000 uniprocessor to SMP upgrades available

6.5% financing through IBM Credit Corp.*

IBM, the IBM logo, AIX, and POWERPC are trademarks of International Business Machines Corporation. UNIX is a registered trademark in the U.S. and other countries, licensed exclusively through the X/Open Company Limited. All other trademarks are the property of their respective owners. © 1994 IBM Corp.

Announcing
VERSION 4.0!
Including InfoMaker
Call 1-800-395-3525 for details.

Study these
numbers.



4,100

plus, corporate sites developing real client/server
solutions with PowerBuilder Enterprise

307

strategic partners offering integrated solutions
for PowerBuilder Enterprise

202

application vendors developing commercial software
packages with PowerBuilder Enterprise

84

of the Fortune 100 who are developing and deploying real
client/server solutions with PowerBuilder Enterprise

70

countries worldwide where
PowerBuilder Enterprise is being used

22

vendors who claim their client/server tools
are better than PowerBuilder Enterprise

0

vendors who have client/server tools that actually
are better than PowerBuilder Enterprise

Memorize
this one.



800-395-3525



There's been a lot of talk about
client/server lately. But after all is said
and done, the numbers listed on the
left add up to one unassailable fact.
More organizations are developing
and deploying real client/server solu-
tions with PowerBuilder® Enterprise
than with any other product. Our
customers are creating a whole new
class of innovative applications that
solve today's critical business problems.

So study the numbers on the left.
And then call the one on the right.

Powersoft

Building on the power of people.

Object interoperability

Users give nod to likely OMG outcome

But OSF supporters still claim committee proposal for optional bridge to DCE is insufficient for object standard

By Melinda-Carol Ballou

As the Object Management Group (OMG) closes in on a decision about how its object standard will interoperate with other object models, users said they are satisfied with the approach the group will likely adopt and are relieved the battle is almost over.

"The fight that started a few weeks ago ought to be a small blip in the process," said Michael Brodie, senior staff scientist at GTE Labs in Waltham, Mass., a subsidiary of GTE Corp. "Those vendors ought to get their act together to serve their users."

However, there are some lingering arguments. Although the OMG will probably vote on a TCP/IP-based approach to interoperability for its Common Object Request Broker Architecture (CORBA), proponents of the Open Software Foundation's (OSF) Distributed

Turkey time

Out of 92 votes regarding the OMG's interoperability standard, 48 are in favor of the TCP/IP-based approach proposed by the OMG technical committee. There are 14 votes against and 17 abstentions, according to the OMG's count at press time.

The rest are undecided. OMG officials expect those in favor of the proposal to prevail with a two-thirds majority by Thanksgiving.

Computing Environment (DCE) are still grumbling that they want equal billing.

What's it about?

CORBA is an emerging standard that acts as a kind of object traffic cop across platforms to enable developers to easily distribute objects. About 470 companies, including key systems vendors such as IBM, Hewlett-Packard Co., Sun Microsystems, Inc. and Digital Equipment Corp., are OMG members.

Last month, the OMG technical committee voted to recommend an interoperability standard for CORBA that uses a mandatory application programming interface based on the TCP/IP protocol. This vote supported adoption of the Universal Network Objects (UNO)

proposal backed by Sun, IBM, Expertsoft Corp. and others.

The committee's recommendation also said UNO must include an optional bridge to the OSF's DCE. Key OSF backers include Digital, HP and IBM.

But some DCE proponents said this optional bridge is insufficient because the technology to make DCE and UNO interoperate is not

teroperability, said Robert Bismuth, director for corporate standards at Digital. He added that end users have not had a chance to meet and come up with a consensus on these issues.

Fair enough

However, six out of seven customers reached by *Computerworld* agreed that the current proposal is an acceptable compromise.

"Because the end-user community is diverse, there have to be options," said Peter Walker, end-user representative to the OMG and an analyst at a UK-based telecommunications company. "The DCE option is not eliminated; it's simply not mandatory," Walker added.

Chris Stone, president of the OMG, said the DCE group is "snatching defeat out of the jaws of victory" by saying "they lost and we won, and it isn't fair."

"It looks as if Digital and HP were trying to steer things toward getting more acceptance for solutions that they've put into the market already," said one developer who asked to not be identified.

"I think the Digital/HP maelstrom is 80% politics and 20% technical," the developer added.



available and has not yet been specified. Further, they said, the DCE-based proposal would offer end users more choices. DCE runs on top of a range of network protocols other than TCP/IP, including Open Systems Interconnect and Novell, Inc.'s SPX.

"We'd like DCE and UNO to be peers and have support for one of them be sufficient" for CORBA in-

Andersen ready to fly with Project Eagle

Object-based client/server initiative set to launch

By Ellis Booker

Proof positive that object technology has entered the mainstream is the fact that leading systems integrator Andersen Consulting is set to launch a major practice around it.

Andersen has spent more than \$25 million during the past three years in a client/server, distributed, object-based computing initiative known internally as Project Eagle. The fruits of Eagle have included the development of in-house expertise in object technology for commercial business systems and the creation of pilot applications ranging from order entry to workflow.

In fact, Andersen is just one of a list of systems integrators racing to deliver object know-how to a market increasingly ready to deploy it.

Other integrators with object groups include American Management Sys-

tems, Inc. in Arlington, Va., IBM, Electronic Data Systems Corp. and SHL Systemhouse, Inc.

Andersen executives said they will target vertical industries next year. Possible segments include financial services, health care and telecommunications, although the consultancy has not made a definite decision on its strategy.

Andersen's Advanced Systems Development Group is the site of much of its push in to object technology. The laboratory has been visited by some 73 users to date.

Vi Beaudreau, director of advanced technology at ITT Hartford Life Cos. in Hartford, Conn., has been through the lab twice this year. Andersen is one of a number of vendors and integrators he talked with as part of The Hartford's object efforts.

The insurance company does not plan to develop every last item of its object-

based applications in-house. For instance, the company is piloting a third-party workflow system that may eventually be added to The Hartford's enterprise class libraries.

Staffed by a team of 75, Andersen's Advanced Systems Development Group began developing and simulating its first object-based applications in March and now has two up and running in pilot form. The second reuses about 95% of the first for a sevenfold productivity gain.

Andersen is just one of a list of systems integrators racing to deliver object know-how to a market increasingly ready to deploy it.

Waste not, want not

Andersen's target is to build 60% to 80% of applications out of "reusable components." A component is a larger object, such as a reservation system, built out of simpler objects.

"We can use this gain for margin or as a space to put more functionality in our applications," said James P. Adamezyk, one of the two partners in charge of the Advanced Systems Development Group.

"What used to be the labor in systems integration is being encapsulated in code, in objects," explained Angela Hey, client/server program manager at Input in Mountain View, Calif. "Instead of using people, [integrators] will reduce their development cost by substituting objects and components for labor."

Andersen's approach is slick, said John R. Rymer, editor of the "Distributed Computing Monitor" at the Patricia Seybold Group in Boston. "They have networked agents, workflow and event management in the mix as a part of the architecture," he said.





SYBASE INTEROPERABILITY VS.

Interoperability. The ability to access and work with virtually all enterprise data – wherever it may be. Only Sybase has it.

That's because true interoperability is determined by an open client/server architecture. And that's unique to Sybase.

With Oracle, you get only point-to-point connections. Worse, code has to be written to include each new data source.

That's not architecture, that's remodeling.

WRITE A SINGLE QUERY VS. WRITE A TON OF CODE.

With Sybase, simply write one query. You get read/write access to over 20 data sources – including the mainframe.

Oracle connects only half as many data sources, and most of them are read only.

This leaves only one way to get Oracle to the far reaches of your enterprise.

Hire an army of programmers.

And while they're writing code, you keep writing checks.

"SYBASE IS A CONNECTIVITY POWERHOUSE."

— Forrester Research, Inc. —

The analysts agree on Sybase leadership. Here's more from Forrester: "Oracle falls way behind on the connectivity front."



THE ORACLE WEB.

FOUR KEY DIFFERENCES	SYBASE	ORACLE
Open client/server architecture	YES	NO
Read/write access to 20+ databases	YES	NO
Database independence	YES	NO
125+ certified tools	YES	NO

While Oracle tries to pave the information highway with its Media Server, Sybase will devote its energy to filling in the real-world potholes on the road to client server.

It's pretty clear. If you expect to move, manage, and access data enterprise-wide, go with Sybase.

However, if you're only going from point A to point B, Oracle will be happy to take you for a ride.

THE HAVES AND THE HAVE-NOTS.

Check the four key differentiators in the chart. If you crawl into that Oracle web, you're stuck at "No," and you're not going to get to "Yes."

So to work anywhere, with anything, say yes to interoperability right from the start. That's what over 700 of the Fortune 1,000 have already done – because only Sybase is client/server for the enterprise.

WHAT THE CUSTOMERS SAY.

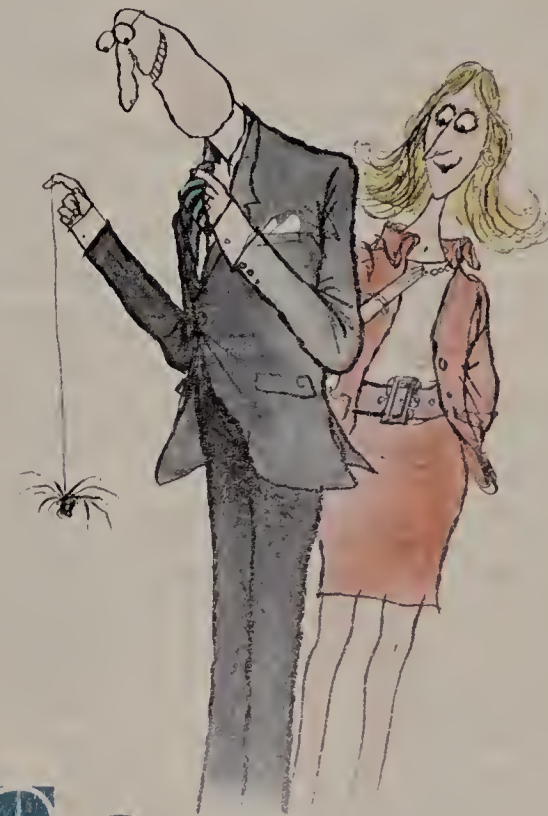
"Sybase is a partner in our success. By using their interoperability products, we've been able to save thousands of hours in development time."

— Marty Solomon,
Connecticut Mutual Life Insurance

"No other company brings what Sybase does to the enterprise. Their interoperability products are a central piece of the puzzle when you want a transparent, hybrid environment."

— Ron Krikorian,
Air Products and Chemicals

For a free copy of recent Forrester and Gartner reports on interoperability, call 1-800-SYBASE-1, ext. 6110.



THE ENTERPRISE CLIENT /SERVER COMPANY

Sky's not the limit with 3-D geographical software tool

By Erin Callaway

Steve d'Apollonia is doing work that is out of this world.

At least it will be out of this world early next year when the Canada Center for Remote Sensing launches a new satellite. The image-processing application d'Apollonia created will put the satellite's images into a database that users can access to order pictures of particular regions or to plan orders from upcoming orbits.

D'Apollonia, president of Dataquest, Inc., a small software development company in Dartmouth, Nova Scotia, is doing the job with Hipparchus, a library of geographical software tools from Geodyssey in Calgary, Alberta. The software can be used to develop applications that do everything from mapping ocean surface temperatures to turning a marketing database into a color-coded representation of customer locations.

Gung ho for Hipparchus

Hipparchus's flexibility and ability to let users customize applications are what sold d'Apollonia.

"Most of the [geographic information systems] software out there doesn't allow you to customize," d'Apollonia said. The real time-saver "is that the library comes with a variety of really flexible geographic functions," he explained.

D'Apollonia estimated that Hipparchus will reduce his development time from eight months to three. "It comes with a library of math functions that saved me from having to calculate all that stuff myself," he said.

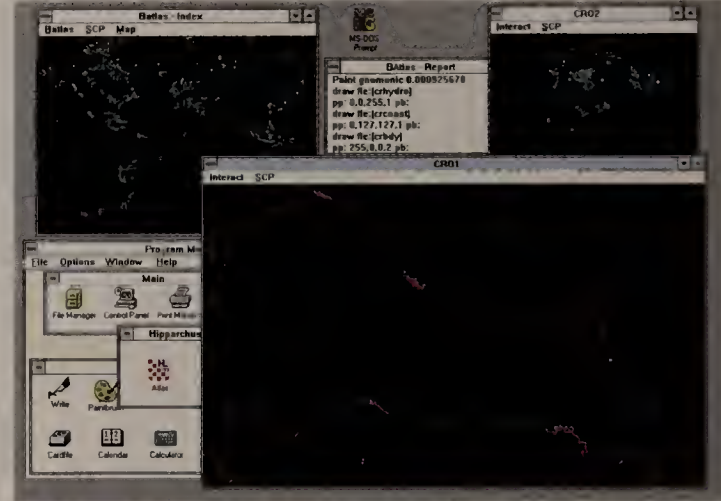
Small potatoes

According to a 1994 study by Dataquest in San Jose, Calif., business use of geographic information systems (GIS) is growing rapidly but currently represents only 6% of the GIS software market.

Hipparchus works by providing a full library of C++ geographic functions that developers can use to link to any proprietary or off-the-shelf database management system and graphical user interface, including Microsoft Corp.'s Windows NT and IBM's OS/2. The tool's spatial information engine

lets users make complex queries against the database to produce three-dimensional geographic data models.

Joe Breslawski, president of third-party software developer CD PubCo., Inc. in Calgary, said users might find using Hipparchus with the Windows operating system a bit challenging. His company's



Geodyssey's Hipparchus tools library has a spatial information engine that lets users make complex queries against databases to produce 3-D geographic data models

retrieval engine uses Hipparchus with Windows NT.

"It took a lot of teamwork to get Hipparchus to work with NT," Breslawski said. "If you're scared of NT, you'll probably be scared of this tool kit."

Unusually robust tool

But the way Hipparchus treats three-dimensional images makes the product unique and powerful, according to Breslawski.

"People are used to thinking of databases in terms of blocks and squares.

Hipparchus thinks of them in terms of honeycombs. It takes a while to ramp up before you understand how it's working. But once you do, it's very robust," he said.

Cathy Hale, an analyst at Dataquest, Inc., in San Jose, Calif., said Geodyssey may have found an emerging market. "The problem is that no one wants to take the time to develop a GIS application themselves," Hale said.

Little need

The bulk of the need right now, according to Hale, is in the independent software vendor community. As a rule, "the market is not at a place right now where end users are looking for GIS tool kits," she said.

James Rapinach, an analyst at Daratech, Inc. in Cambridge, Mass., agreed. "Whether there will be a higher demand among corporate end users for GIS tool kits depends on how well companies like Geodyssey can move past the 'gee-whiz' factor and demonstrate the real value of their application development tools," he said.

"A product like Hipparchus can add a lot of value to the reams and reams of unusable data that often resides in large databases," Rapinach added. "GIS can prove very effective in terms of pay-back."

Briefs

Warehouse vendors unite

SHL Systemhouse, Inc. announced a marketing alliance with several data warehousing companies last month to sell their various tools. The alliance, which was dubbed Diamond, will promote a best-of-breed approach and includes Information Advantage, Inc., Prism Solutions, Inc. and Informix Software, Inc.

Consultants form start-up

Three principal consultants at Oracle Corp. announced last month that they have left the database company to form their own company. Based in San Mateo, Calif., The Rightsizing Group will cater to users with databases of 50G bytes or more.

Help for DBMS scaling

Informix Software and Cray Research, Inc. are working to provide support for very large database scaling using the Informix-OnLine Dynamic Server 7.10 database and the Cray Superserver 6400 symmetric multiprocessor.

Borland bundles tools

Borland International, Inc. recently announced a bundle of its C++ 4.5 development language with the Borland Database Engine 2.0 database library and SQL Links 2.0 for Windows interface to various back-end relational servers. The package is priced at \$799, a savings of \$195 vs. buying the products separately.

Current Borland C++ users can buy the bundle for \$249.95. Users of Microsoft Corp.'s Visual Basic or Visual C++, Powersoft Corp.'s Watcom or Symantec Corp.'s C or C++ tools can trade in for \$299.95, according to Borland.

Cincom to resell Easel tool

Cincom Systems, Inc. said recently it will resell Easel Corp.'s Object Studio tool set as its strategic tools offering. Easel said it expects this deal to generate upward of \$20 million during the next five years.

Oracle grant to benefit kids

Oracle announced recently a \$1 million grant program for software developers and content providers to create interactive educational software for grades K through 12,

provided that the products are built with Oracle's media objects scripting tool. Oracle plans to give \$25,000 each to 20 developers in February 1995 and \$100,000 each to five firms in April, the company said. Interested parties should call Theresa Baker-Hancock at (415) 506-4403.

Qualix offers migration aid

Qualix Group, Inc., a San Mateo, Calif., maker of client/server database add-on products, recently announced a \$16,000 set of utilities to help mainframe users migrate systems to Oracle's Oracle 7 database. The product is called Smart DB Workbench.

Ontos unveils tool suite

Ontos, Inc. earlier this month introduced integration services, an object-oriented framework and tool suite that extends the company's object-oriented database. The Ontos Virtual Information Architecture (Ontos VIA) allows applications built with GUI-based tools to share data on the front and back end. New with this release is Object Integration Server for Sybase, Inc.'s database, which will provide object-oriented access to Sybase's database.

Data View

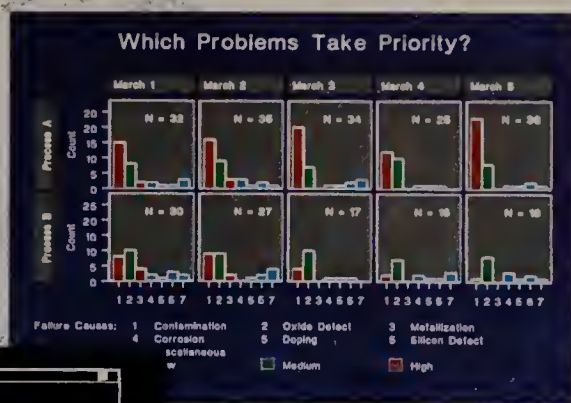
CLIENT/SERVER TOOLS MISSING IN ACTION

Application development managers were asked to name their major problems

Systems and network monitoring	30%
Need for better development tools	27%
Systems and network management	24%
Testing and tuning	13%
Change and configuration management	11%
Need for better standards	6%
Design and project management	6%
Version control	6%
Training	5%
Security	5%
Archive, backup and library	2%
Software licensing	2%
Other	36%

BASE: 120 (MULTIPLE RESPONSES ALLOWED)

Source: International Data Corp., Framingham, Mass.



Break Down the Barriers Between People and the Information They Need

**With the SAS® System —
The World's Leading Information Delivery System.**

A lot of obstacles stand between your organization's two most important assets: *people* and the *information* they need to make better decisions. With the SAS System, you can deliver the right information to the right people at the right time. Every time. And you can break down all the barriers created by...

Diverse Data Sources

The SAS System turns your organization's "islands of information" into generalized resources available to any user or application—no matter where or how data are stored, from popular databases to remote external files.

Diverse Applications

The applications that drive your enterprise are fully integrated in the SAS System—everything from EIS and decision support to financial analysis and reporting to quality management. This comprehensive approach eliminates the need for single-shot software solutions that have made a patchwork quilt of your applications strategy.

Diverse Client Needs

The specific needs and experience level of every client—from new computer users to seasoned pros—are met through personalized interfaces. Take advantage of icon-based executive information systems, point-and-click

menus for business analysts, an object-oriented applications development environment, or a full-screen display environment just for programmers.

Diverse Computing Platforms

The SAS System maximizes the effective use of your entire computing mix—from PCs and workstations to minicomputers and mainframes. You'll have true hardware independence—without sacrificing your ability to exploit the particular advantages of specific environments. Plus the ability to implement cooperative processing by segmenting applications any way you choose.

For your free video introduction to the SAS System, give your Software Sales Account Manager a call today at 919-677-8200. Also ask for details about the free SAS System Executive Briefing—coming soon in your area.



SAS Institute Inc.
Software Sales Division
SAS Campus Drive ☐ Cary, NC 27513
Phone 919-677-8200 ☐ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1992 by SAS Institute Inc. Printed in the USA.

"Digital will extend its winning streak in the desktop business, based on close attention to details in the realms of usability and serviceability"

IDC, 9/9/94

If *you're* considering PCs other than *ours*,

Then get a second opinion, a third and a fourth—the analysts all agree.

Our new PCs really are designed with the users' needs in mind. They're simpler to use. Simpler to customize. Simpler to network. And backed by a



Look for the Intel Inside® symbol on our quality computer systems.

service and support organization (offering a three-year comprehensive warranty) that's simpler to do business with.

Which is why more and more MIS professionals and users are considering—and buying—Digital PCs.

Call 1-800-234-6741 for your nearest reseller.



Please reference JHA when you call 8:30 am - 8:00 pm ET, Monday through Friday.

maybe
you should
consider
an analyst.

...a degree of flexibility and upgradability rare in today's market ...Digital also shines in our reliability and service survey."

PC World, 9/94



DIGITAL SEEMS TO BE SETTING THE PACE FOR OUT-OF-BOX USABILITY.

Computerworld

digital
PC

See and respond to multi-media
messages from your desktop.



How do you
take 30 orders,

fax 30 receipts,

Use voice response
to let customers
help themselves.



and *work* with 3
foreign offices before
you *wake up?*

Do business anytime,
anywhere with a global
network.



It's the new office. But it's not what you think. It's an office without walls or desks. Without the rules of time or place. It lets you work the way you *want* to, instead of how you have to.

It can all happen, with AT&T's INTUITY™ Multi-Media Solutions. An ever-expanding communications framework that plugs you into all the latest technology as it happens.

INTUITY Solutions let you market to your customers in innovative ways. Free you from routine tasks. Open your office to the rest of the world. And to the future.

AT&T can do all these things for you today. And with the integration of fax, interactive voice, data and video, you'll be able to do things you never imagined.

Call AT&T Global Business Communications Systems at 1800 325-7466, ext. 537. Find out how INTUITY AUDIX® Solutions and INTUITY CONVERSANT® Systems can help set you free.

AT&T. Where innovation leads.



New Products

Trinzic Corp. has announced Aion Development System 6.4, a visual development environment for building business-process automation applications.

According to the Palo Alto, Calif., company, Aion Development System 6.4 leverages Windows and OS/2 environments and supports Microsoft Corp.'s Dynamic Data Exchange.

Applications built with the product can be ported to mainframe or midrange platforms, including MVS, IBM's AIX and Sun Microsystems, Inc.'s SunOS.

Aion Development System 6.4 costs \$9,000.

► **Trinzic**
(415) 328-9595

ACI US, Inc. has announced Object Master for Windows, an integrated, cross-platform programming tool for writing and organizing C and C++ source code.

According to the Cupertino, Calif., firm, Object Master for Windows lets Windows and Macintosh programmers use the same project interchangeably on both platforms.

The product includes a source code editor, a project window, a browser and a class tree window for users to view different parts of the class tree simultaneously. Each file is parsed as it is added to a project and is included in a data dictionary.

Object Master for Windows is priced at \$249.

► **ACIUS**
(408) 252-4444

ARSoftware Corp. has announced Arc++ 2.0, a C/C++ development tool.

According to the Landover, Md., company, Arc++ eliminates unnecessary recompilations resulting from header file editing.

An intelligent macro capability automatically analyzes class definitions and is capable of being inherited. Other features include overloaded enumerators, automatic functions, modify detection and hidden arguments.

Arc++ 2.0 costs \$89 for DOS and Macintosh and \$129 for Unix.

► **ARSoftware**
(301) 459-3773

ViewSoft, Inc. has announced Utah 1.1, a C/C++ application development environment for graphical user interfaces (GUI).

According to the Provo, Utah, company, Utah 1.1 lets developers interactively create GUIs without adding interface dependencies to program objects or writing interface code.

The product transparently performs type conversion and synchronization of interface objects with program data whenever an interface or program variable changes. Developers can use their C/C++ compiler of choice to turn the prototype GUI into a finished product.

Utah 1.1 costs \$1,490.

► **ViewSoft**
(801) 377-0787

Melillo Consulting, Inc. has announced Exemplar, a man page and source code browser.

According to the Somerset, N.J., firm, Exemplar is a Motif/X Window System client that provides an integrated view of man pages with associated example code fragments.

Features include point-and-click access to related include files, "see also" lists, a library of source code examples, the ability to cut and paste examples to

standard Unix editors and the ability to filter man pages by standards compliance.

Prices start at \$275.
► **Melillo Consulting**
(908) 873-0075

VI. Corp. has announced X-Designer 4, a cross-platform, graphical user interface builder for Motif and Windows applications.

According to the Northampton, Mass.,

company, X-Designer 4 includes a Windows mode for Windows development that can generate Microsoft Corp. Foundation Class Library code and be compiled with native Windows tools.

The product generates C or C++ code, provides hypertext help and includes an unlimited undo feature and a compound string editor.

X-Designer 4 costs \$3,500.

► **VI.**
(413) 586-4144

**"MY CLIENT/SERVER PROJECT
IS STALLED.
I DON'T NEED ANOTHER TOOL.
I NEED A STRATEGY."**



What you need is Enterprise Object Architecture™ (EOA). The only object-oriented strategy that lets you migrate to client/server computing while fully leveraging your investment in existing people, tools and methodologies.

**SUCCESSFULLY MIGRATE AT
YOUR OWN PACE.**

Developed by Digitalk, the company that brought Smalltalk/V® and PARTS® to the Fortune 500, Enterprise Object Architecture is a comprehensive distributed component strategy. But EOA's most important component is people. Yours and ours.

Your people will provide insight

into your corporate goals and culture. Our world-class EOA experts will provide as much – or as little – analysis, design, planning, consulting and training as your unique situation requires. It's a partnership that can take your enterprise into the next century. And it's already working at major service and manufacturing companies.

A FORTUNE 500 STRATEGY.

Tools may put out fires and provide short-term savings, but they won't solve the long-term issues of enterprise-scale development, data access and distribution of business logic.

But with Digitalk's Enterprise Object Architecture, hundreds of companies – including

Fortune 500 corporations – are addressing critical client/server issues with their own legacy systems and people. The result is a tremendous savings in time, money and human resources.

**CALL FOR OUR FREE EOA
WHITE PAPER.**

Don't wait for your client/server project to stall. And don't reach for another development tool. Our comprehensive strategy for migrating to client/server computing is in our Enterprise Object Architecture White Paper.

Call 1-800-531-2344 x 802 now to request yours. Because you don't need another tool. You need a strategy that works.

OBJECT ARCHITECTURE FOR CLIENT/SERVER.

DIGITALK

The perfect network for a product today than

Let's see if we've got this right. IBM and Microsoft are clamoring to sell you your next network operating system, but there's a small glitch. Their operating systems aren't quite ready yet. In fact, they can only deliver 2 of the 7 services a network needs to perform today. In the meantime, how does a promise to offer you a full service system somewhere down the line sound? Are they kidding?

FEAR OF THE UNKNOWN IS A HEALTHY THING.

If banking on a promise makes you a little nervous, you're smart. After all, we're talking time and money here. So consider this: although networking today requires more than just file and print, those basics are all IBM and Microsoft can deliver right now. (And even those aren't up to NetWare standards.) In the meantime, networking with 32-bit NetWare 4 has evolved to create distributed systems that speed

NETWORK USERS. THE VOTE IS IN.

IDC Jan-June 1994 Server Network Operating Systems Node Shipments*
Novell: 72% / Banyan: 7% / Microsoft: 7% / IBM: 7% / DEC: 3% / Other: 4%



timely information directly to the people who need it. At the moment they need it most. That kind of feat demands a proven product, not just a promise. And right now Novell's NetWare 4 is the only one that can deliver.

COMPARISON SHOPPING MADE EASY: WE'VE GOT IT, THEY DON'T.

Networking today means being able to hook up with people and information anytime, anywhere with a single login. Performance like this requires seven crucial services from your network. The chart on the right shows you how Novell stacks up against the competition in each of these areas. Here's the scoop on what these services could be doing for you now.

The directory service allows you to simply log in to the network once to get the info you need the moment you need it. No more looking for data in all the wrong places.

Built-in messaging lets you use most of the popular groupware packages such as E-mail, calendaring and others. And because it uses the same directory as the network operating system, you're blessed with a single-point-of-administration.

Multiprotocol routing with NetWare gives you software-based routing (no new hassles, no new hardware) for connecting your network with the rest of the world. That way, you get the info you need anytime, anywhere. And you can collaborate with anyone, anywhere.

Network management with NetWare 4 lets you manage your entire network from a single-point-of-administration.

NEXT GENERATION NETWORK SERVICES. READY OR NOT?

Services	Novell NetWare 4	Microsoft NT Server 3.5	IBM LAN Server 4.0
1 Directory	Yes.	No	No
2 Integrated Messaging	Yes.	No	No
3 Multiprotocol Routing	Yes.	No	No
4 Network Management	Yes.	Limited	Limited
5 Security	Yes.	Limited	Limited
6 File	Yes.	Yes.	Yes.
7 Print	Yes.	Yes.	Yes.

And our graphical MS Window's management tools reduce repetitive, multi-step tasks to a simple click of a mouse.

Security with NetWare 4 allows administrators to control access to sensitive information within a distributed environment. In fact, it was designed to meet the National Computer Security Center's Class C2 Network Security criteria.

And last but not least, file and print. Only NetWare 4 offers data migration, suballocation and compression so you won't have to buy extra hardware like

people who'd rather buy a promise tomorrow.

the other vendors require. Simply put, our file and print services beat IBM and Microsoft cold on both performance and cost.

555 DAYS UP, 0 DAYS DOWN:
ONLY NETWARE 4 IS
A SURE THING TODAY.

NetWare 4 doesn't just sound good, it works. And there's nothing like months of solid performance and happy users to prove it. Folks tell us NetWare 4 is a product they can count on today as well as tomorrow. Others report that it has given them stability and performance, and has proven itself in business critical applications. Quite simply, NetWare 4 is doing everything our customers need it to do. Now.

WHO ARE YOU GONNA CALL?
NOVELL'S SUPPORT ENGINEERS
OUTNUMBER MICROSOFT'S 50 TO 1.

Buy NetWare 4 and when you call for help you'll get answers, not a run-around. Only Novell has over 47,000 Certified Novell Engineers working with 20,000 Novell authorized resellers. Not to mention a veritable arsenal of everything from technology and solution partners to systems consultants and integrators. The point is, we don't sell you the product and disappear.

THEY BOX YOU IN, WE SET YOU
FREE: THE OPENNESS THING.

Trapping you into using products from a single vendor isn't in our game plan. Not only do we work within the industry to insure product compatibility with all the hardware and software you use, but we've gone out of the way to make sure that every application written for NetWare 3 runs on NetWare 4. It's only fair.

We've also worked hard to make sure the migration path for NetWare 4 is easy and risk-free. On top of having the same basic architecture that we've always had, NetWare 4 also features built-in migration tools so you can upgrade now.

And because our NetWare 4 server can manage NetWare 3, you can transition at your own pace. Even installation and administration are more hassle-free.

BUT WAIT, THERE'S MORE.
HOW DOES A 300% RETURN
ON INVESTMENT AND
A FREE UPGRADE SOUND?

Research shows that approximately 70%** of the cost of a network is administering and managing the network and its applications. By simplifying the

administrative load, NetWare 4 slashes the cost of administering your network by roughly 25%†.

Customers who added these savings to those garnered by eliminating additional hardware expenses have reported up to a 300% return on their investment in NetWare 4. Better yet, if you buy 4.02 now we'll upgrade your network operating system free through March, 1995. What a deal.

PROOF THAT WE'RE THERE
IS IN HERE. OUR FREE BROCHURE.

We'll be the first to admit that this is a lot of information for one ad to carry. And believe us, it's not all we have to say on the subject. The way we stack up against the competition is impressive. The product we've built over the past 11 years is proven. And you can get the nitty gritty details on all of it by calling 1-800-554-4446 now.

 **NOVELL**

NetWare 4
The only network
ready for tomorrow, today.



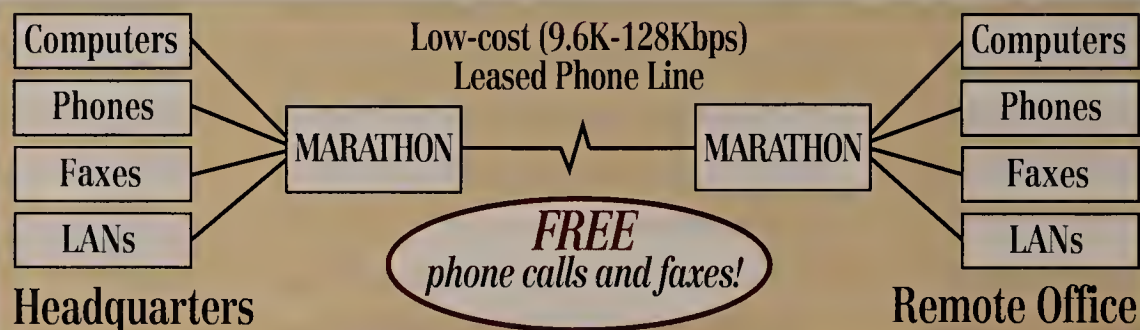
"Marathon buys one of these every month"

"We were skeptical about the savings. Even after we saw a live demonstration, we didn't think Marathon could save our classic Corvette dealership all that much money. But we figured we'd save at least enough to pay for the equipment and then keep some savings each month. So we installed a MICOM Marathon Data/Voice Network Server in our Saugus Massachusetts showroom and another in our new Pompano Beach, Florida facility.

Marathon let us route incoming calls between our locations for free.

In just the first month, the savings paid for both Marathons. And every month since, Marathon has saved us the equivalent of a '58 Vette.

I'm Tony Visone of Visone Motors. I sell investments you can use and enjoy. And while a Marathon can't give you the same thrill as a vintage Corvette in your garage, it's an investment that can bring a smile to your face every month."

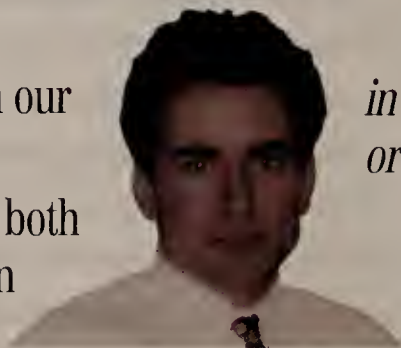


Whether you have two or 250 locations, Marathon delivers all communications on one

line. Ask for a free brochure today.

Call toll-free for the certified Marathon Distributor in your area (800) MICOM AD [642-6623], ext. 1034 or (805) 583-8600. 24-hour fax (805) 583-1997.

"The sooner you call, the sooner you can start investing in something you really want, instead of phone company toll charges."



MICOM[®]

Products that pay for themselves.[™]

Trademarks are property of their respective owners

IS teams encourage collaboration and creativity among staff members.

But IS managers must learn how to mediate between warring personalities

to win at their own version of . . .

Family Feud



ILLUSTRATIONS BY SCOTT POLLACK



BY ROCHELLE GARNER

Darren Franchow was not pleased. Instead of the collaboration and creativity he had envisioned from his newly formed information systems teams, he saw bickering, withdrawal and anger.

Strong-willed personalities ran roughshod over their shier teammates at CompHealth, Inc. Members less comfortable with conflict withdrew into silence and noncooperation. Feelings were rubbed raw, work stalled and peer evaluations became opportunities for revenge.

Admittedly, Franchow had screwed up. His blunder: He hadn't prepared his Salt Lake City staff for the behavioral changes successful teams require. "Teams force a closeness and a

camaraderie that some people feel uncomfortable with," Franchow acknowledges. "I didn't give them enough time to adjust."

He didn't make the same mistake twice.

Nor did he give up on teams. For Franchow, the team approach is essential for tackling the many-layered challenges of client/server. That's why this past February, when he assumed his new post as director of IS for Salt Lake County, Utah, Franchow put out the word that the new order of business would be teamwork.

Two months later, he'd reshaped the county's help desk into its first IS team. Soon after came project teams, function teams and teams distributed to the hinterlands of the county to work directly with customers. And it's working. Teams are taking on responsibility, customers are happier, and staffers are energized with creativity.

Family Feud, page 88

We, the people of Pennant, in order to form a more perfect business world, hereby establish and ratify a new definition of printing.

We call it *presentation*.

At Pennant,TM The IBM Printing Systems Company, we maintain that you don't always need to print information. And with our printing systems, you

can deliver information—present it—in other, more cost-effective ways. On computer screens and faxes. At an office down the hall. Or across the country. Indexed and archived. With voice, video, graphics, logos, and fonts.

What you get out of all this is a major reduction in printing and paper costs. Largely because you print

We the People

of the United States, in order to form a more perfect Union, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Article I

Section 1. All legislative Powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and Representatives.

Section 2. The House of Representatives shall be composed of Members chosen every second Year by the People of the several States, in each State shall have ^{Representatives} ~~one~~ ^{at least} one Representative, but no State shall have less than two Representatives, nor shall any State have a greater Number of Representatives than its equal Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, three fifths of all other Persons. The actual Enumeration shall be made within three Years after the first Meeting of the Congress, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct. The Number of Representatives shall not exceed one for every thirty Thousand, but each State shall have at least one Representative, and until such Enumeration shall be made, the State of New York shall have three, Massachusetts eight, Rhode Island and Providence Plantations one, Connecticut five, New York seven, New Jersey four, Delaware one, Maryland three, Virginia ten, North Carolina five, South Carolina five, and Georgia three.

When vacancies happen in the Representation from any State, the Executive Authority thereof shall issue Writ of Election to fill such Vacancies.

Section 3. The Senate of the United States shall be composed of two Senators from each State, chosen by the Legislature thereof, for a Term of six Years, and each Senator shall have one Vote.

Immediately after they shall be assembled in Consequence of the first Election, they shall be divided as equally as may be into three Classes. If the Senate of the first Class shall be vacated at the Expiration of the second Year, of the second Class at the Expiration of the fourth Year, and of the third Class at the Expiration of the sixth Year, so that one third may be chosen every second Year; and if Vacancies happen by Resignation, or Death, or otherwise, during the Course of the Term, the Executive Authority of the State in which such Vacancies happen, shall issue Writs of Election to fill such Vacancies.

No Person shall be a Senator who shall not have attained to the Age of thirty Years, and been seven Years a Citizen of the United States, and who, when elected, shall be an Inhabitant of that State in which he shall be chosen.

The Vice President of the United States shall be President of the Senate, but shall have no Vote, unless they be equally divided.

The Senate shall have the Power to try all Impeachments, when sitting for that Purpose, they shall be on Oath or Affirmation. The Chief Justice shall preside. And no Person shall be convicted without the Concurrence of two thirds of the Members present.

Judgment in Cases of Impeachment shall not extend further than to removal from Office, and disqualification to hold and enjoy any Office of Honor or Profit under the United States, but the Party convicted shall nevertheless be liable to Indictment, Trial, Judgment, and Punishment according to Law.

Section 4. The Times, Places and Manner of holding Elections for Senators and Representatives, shall be prescribed in each State by the Legislature thereof; but the Congress may at any time by Law make or alter such Regulations, except as to the Places of choosing Senators.

The Congress shall assemble at least once in every Year, and such Meeting shall be on the first Monday of the next Year.

Section 5. Each House shall be the Judge of the Elections, Returns and Qualifications of its own Members, and may determine the Rules and Order of Proceedings, and may punish its Members for disorderly Behaviour, and may suspend its Members from sitting, and may, with the Concurrence of two thirds, expel a Member.

Each House shall keep a Journal of its Proceedings, and from time to time publish the same, excepting such Parts as may in any Case require Secrecy; and the Yeas and Nays of the Members of either House on any question shall also be published.

Neither House, during the Session of Congress, shall adjourn for more than three Days without the Consent of the other House.

Section 6. The Senators and Representatives shall receive a Compensation for their Services, to be ascertained from time to time by a Law of the United States. They shall in all Cases, except Treason, Felony and Breach of that Peace, be privileged from Arrest during their Attendance at the Session of their respective Houses, and in going to and returning from the same, and for any Speech or Debate in either House.

No Senator or Representative shall during the Term for which he was elected be appointed to any civil Office under the United States, which shall have been created, or the Emoluments whereof shall have been increased during the Term for which he was elected.

Section 7. No Money shall be drawn from the Treasury, but in Consequence of Appropriations made by Law; and the actual Budget and Accounting of the Receipts and Expenditures of all the Money so drawn shall be published from time to time.

Section 8. No Tax or Duty shall be laid on Imports or Exports, except such as may be necessary to execute the Inspection Laws, and no Tax or Duty shall be laid on Articles exported from any State.

Section 9. No Capitation or other direct Tax shall be laid, unless in Proportion to the Enumeration of Persons in each State, which shall be once in ten Years, until such Enumeration shall be made, and no Excise or other direct Tax shall be laid, unless in Proportion to the Enumeration of Persons in each State, which shall be once in ten Years, until such Enumeration shall be made.

Section 10. No State shall enter into any Treaty, Alliance, or Confederation, or grant Letters of Marque and Reprisal, or coin Money, or emit Bills of Credit, or make any Thing but gold and silver Coin legal Tender for Payment of Debts, or pass any Law of Retrospectivity, or ex post facto Law, or any Law impairing the Obligation of Contracts, or any Law granting any Title of Nobility.

Section 11. No State shall be obliged to furnish Troops, or other Military Force, for the Service of the United States, unless in Proportion to the Number of free Persons in each State, which shall be once in ten Years, until such Enumeration shall be made.

Section 12. No State shall be obliged to furnish Troops, or other Military Force, for the Service of the United States, unless in Proportion to the Number of free Persons in each State, which shall be once in ten Years, until such Enumeration shall be made.

only what you need, when you need it, in the form you need it.

But we're not advocating the paperless office, just an office with less paper. You'll always have to put marks on a page, and when you do, no company offers more printing system options than Pennant. All with the best service in the business, with coverage available

24 hours a day, 7 days a week, 365 days a year.

Which means we're there for you every step of the way: from the management and distribution of information right down to the printed page.

Call 1-800-PENNANT for more information.

It too, will be worth considerably more than the paper it's printed on.

**IT'S THE INFORMATION THAT'S
IMPORTANT, NOT THE PAPER.**

Redefining Printing.TM

PENNANTTM
An IBM Company

Family Feud

CONTINUED FROM PAGE 85

The difference between the two organizations: Franchow has reasserted his role as manager — but with a twist. Instead of the management norm of issuing directives to his staff, he now mediates between warring personalities. This can be unfamiliar territory for IS managers, but mastering this new role is critical if the team is to succeed. IS executives must learn how to temper the domineering and draw out the reticent. "Teams really change the nature of the manager. You have to train, coach, facilitate and plan," Franchow says.

Hard lessons, but necessary ones. In the process, Franchow has learned to deal with the human foibles that can undermine a team through subversion and intimidation. His experiences serve up valuable object lessons to others testing the teamwork waters.

The reason? Teams nearly always cause emotions to well up and breed hard feelings that many IS technologists are ill-equipped to deal with. Ignore those emotions and your teams will become a roiling mess of unrestrained egos, passive aggression and noncommunication. And then they fail.

Madeline Weiss, president of Weiss Associates, Inc. in Bethesda, Md., puts the blame squarely in the manager's lap. "If the team isn't working, the fault primarily lies with the coach," she says. "You need to have the coach negotiate who will do what, who will make what kinds of decisions, and as the team becomes more confident, the manager must let go of those decision-making roles. The development of the IS team coach is absolutely critical for success and must begin long before the team is set up."

DON'T GET MAD, GET EVEN

Intriguingly, team dysfunction has a pattern: Extroverts try to take over. Introverts either withdraw into a shell or resist through passive/aggressive subversion. Guess which personality causes bigger problems?

"It's the passive/aggressive type you have to worry about because they won't tell you what's going on," Franchow says. "Extroverts are vocal, so you always know what's happening."

What's happening is a collision of egos. On one side, you have the domineering engineer who speaks his mind no matter what; on the other, the reticent analyst, whose ego is the match of anybody else's. Now try to critique an idea — just try.

"You keep running into the attitude of 'I have more experience than you. How dare you try to tell me anything,'" says Robert J. King, vice president of managed care and employee benefits at The Travelers Insurance Co. in Hartford, Conn.

As head of The Travelers' rapid application development efforts, which rely on small project teams, King says he has seen the phenomenon time and time again. Left unchecked, it leads to what King calls "subtle noncompliance, or un-

willingness to participate."

And it brings projects to a halt.

What we have here is a failure to communicate. And one reason that failure exists is a basic lack of respect for others. You've probably seen similar scenarios. A data analyst accustomed to being king of the hill views with contempt any lesser mortal unfortunate enough to have fallen into, say, networking or PC support. If you want your teams to succeed, you have to nip that attitude, fast.

Enter the Meyers-Briggs test of how individuals make decisions — their mental processes — and other tests like it. Think of it as an aptitude test for teams that reveals to members how others use intu-

“A high-performance team is a team that exceeds its objectives, going out of its way to do what's expected and to be creative in figuring out better ways to do their jobs. They act like owners.”



— Madeline Weiss, president of

Weiss Associates,

Bethesda, Md.

EARLY WARNING SIGNS

Managers need to be concerned about the direction IS teams are taking when the following traits emerge:

- Extroverted team members try to take over
- Introverted team members don't participate
- Strong emotions dominate discussions
- Members subtly refuse to comply with or resist team goals
- Deadlines and decisions are delayed
- Discussions about the team's progress become cynical

ition or analysis, for example, to solve a problem. The next step is applying that information.

"We use Meyers-Briggs to focus on each individual's differences," says Carol Smallback, one of four coaches in the technical services group at Corning, Inc., a well-known practitioner of IS teams in the U.S. "Those differences show how people can complement each other so we can build trust within the team."

ROLE-PLAYING AS A TOOL

But building such trust requires more than merely understanding that Joe in networking solves problems differently from Fred in PC support. And that's where Corning goes beyond many companies' efforts.

Meyers-Briggs information in hand, Corning's IS staffers work through four-hour training sessions that have members play roles, solve hypothetical problems and listen to one another.

"If the team's in a problem-solving mode and you feel the team hasn't looked at the data yet, we say, 'Joe's the data gatherer. We need to listen to Joe.' Eventually, they develop trust because they know what motivates each other," Smallback says.

That's exactly what happened at Salt Lake County, says Russ Stout, a systems programmer who led a short-duration pilot project to see if a client/server architecture would benefit the county.

According to Stout, the team was marked by cooperation and communication. "Everyone understood the sense of urgency for the project, and one of the reasons we worked so well was that our IS director had communicated that failure of the project was something to be avoided. And upper management constantly emphasized how we should work together and communicate," he says.

Stout says members entered the team already respecting one another's expertise and capabilities because of the care with which Franchow had chosen the team members.

Such trust and mutual respect are the foundations of a functioning team. But they won't, by themselves, prevent squabbling. After all, you're dealing with IS professionals who have a remarkably low need for human interaction, according to Bob Zawacki, KPMG Peat Marwick distinguished scholar in residence at the University of Colorado at Colorado

Family Feud, page 90

TEAM BUILDING TRAINING

Madeline Weiss, president of Weiss Associates, recommends two or three day training for coaches two to three months before an IS team is put in place. After that, training should be held for both coaches and team members three months after the team forms and then once a month for the next six months. Training should include the following:

COACHES:

- Learning why transferring power is critical
- Identifying the tendency to hold on to control
- Improving communication skills
- Learning how to teach others
- Using performance evaluations as teaching opportunities

TEAM MEMBERS:

- Practicing peer evaluations
- Using evaluations to reinforce the team mind-set
- Practicing budgets and scheduling
- Improving communication skills
- Learning to constructively accept criticism

WATERHOUSE SECURITIES COUNTS ON A BANYAN SYSTEM TO KEEP INVESTORS

IN THE KNOW — AND IN THE MONEY



"The word now goes straight from the street to our clients."

"We put a lot of stock in service. If we can't give our clients instant information and reliable, fast execution, they'll take their business elsewhere."

Frank Conti is a customer service fanatic. He has to be. The knowledgeable individual investors who trade with Waterhouse Securities, one of the nation's fastest growing discount brokers, do not suffer delays gladly. "Using our Banyan network, representatives can confirm a buy in four to six seconds, while the client is on line. They can enter orders, check quotes, update account records and issue detailed reports."

"'Crash' isn't a word we take lightly here. If our network goes down, no orders come in. We needed an industrial strength solution, and a long-term partnership. After taking a hard look at all the options, Banyan was the only way to go."

If your enterprise is facing a customer service challenge, Banyan has solutions you should know about: Enterprise Network Services for NetWare®, HP/UX™, SCO® UNIX®, and VINES®. To receive your free Enterprise Networking Kit, call 1-800-828-2404.



Call or write for our free Enterprise Networking Kit, including "Delivering E-Mail to the Enterprise," or contact your Banyan Premier Network Integrator.

Name _____
Company _____
Address _____
City _____ State _____ Zip _____

1-800-828-2404

Banyan Systems Inc., 120 Flanders Rd., Westboro, MA 01581



Family Feud

CONTINUED FROM PAGE 88

Springs. He bases that belief on more than 20 years of researching IS personality characteristics.

Two traits stand out, Zawacki says: a strong need to grow and be mentally challenged — hence the attraction to new technology — and a low requirement for socializing. Together these traits create a person who prefers to work alone.

More significantly, it's a personality unaccustomed to critique, which is the hallmark of brainstorming. The result: "People don't know how to relate to each other in groups," says Frank Petersmark, technical services manager at The Amerisure Cos. in Southfield, Mich.

OPEN YOUR MOUTH

Petersmark, who manages a 17-member customer support team, found that his biggest challenge was getting members to talk to one another.

"At first, everyone has hard feelings. If it was an outgoing person feeling hurt, there'd be bickering. If it's someone less so, he will come to me to complain to 'Dad.' Sometimes I felt like Ward Cleaver talking to Wally and the Beaver," he says.

After three years, though, Petersmark now has a team that works well together. That doesn't mean team members don't argue, mind you — it's just that now they understand the rules better. "At first, everyone is thin-skinned, and they go out of their way not to [upset] anyone," Petersmark says. "Now we are at the point where we can say, 'Hey, what are you talking about?' That creative tension is necessary for getting things done."

Experts agree with Petersmark. They

also agree it takes people time to reach this stage where they can have their ideas criticized without taking it personally. "Squabbling is an inevitable state that teams go through, and it is a stage that people must go through," Weiss says.

According to Weiss, teams that don't learn to deal with conflict never reach the high-performance stage. But achieving that stage is a balancing act in which

delayed and timeliness suffer as her Green Bay, Wis., colleagues struggled with the team concept. One problem: There's no mechanism to pull everyone together.

"We get graded on our project's success, not on whether we pitch in to help someone who's in trouble," Swingle says. "That brings everything to the level of 'What's in it for me?'"

“It's the passive/aggressive type you have to worry about because they won't tell you what's going on. Extroverts are vocal, so you always know what's happening.”

— Darren Franchow, director of IS, Salt Lake County, Utah



managers hold primary responsibility. How? "You have to coach them so that they gain better ideas the team can work with," Franchow says. "They have to give up their ownership and assign that idea to the team, and that's difficult for people to do."

Not surprisingly, staffers won't do that if there's no overriding reason to. That reason is a common bond.

JUST REWARDS

Just ask Toni Swingle, one of 17 people on Schreiber Foods' application development team. In the past year, she's watched productivity fall, decisions be

What's in it for them is a kind of management schizophrenia, where professionals are told to work together — but not too much. Worse, there's no common goal for members to hang on to. Sure, they all want to look as good to the customer as possible, but that's as abstract as the usual platitudes companies throw around, such as "improved customer satisfaction."

Swingle knows those just don't cut it. "The team approach isn't working as well in IS as it is in the rest of manufacturing because we don't have one unifying goal," she says.

Franchow learned that lesson the hard

TEAM LANDMINE

To give IS teams their best chance for success, managers and coaches should do the following:

- Organize small teams around functions
- Have a unifying goal for the team
- Keep goals simple and narrowly defined

way. That's why he's organizing small teams around functions, such as databases, networking, Unix and graphical user interfaces. At Corning, teams are organized by tasks such as customer support and mainframe operations. And at The Travelers, six-person rapid application development teams have a specific focus and predetermined duration. In each case, the goals are defined enough and narrow enough to remain in each member's line of sight.

And what if you can't think of a common bond? Then don't set up a team, says Linda Moran, an executive consultant at Zenger-Miller, which is based in San Jose, Calif. "Especially in IS — where people often choose that profession because they don't like working with others — you don't want to create teams for teams' sake," Moran says. "Without that common bond, teams just can't be effective."

Garner is a free-lance writer based in San Carlos, Calif.

Executive Track

The Leading Hotels of the World Ltd. in New York has announced the appointment of **Norbert J. Kubilus** to the position of vice president of operations. He will report to Joseph A. Giacomponello, president and chief executive officer.



Kubilus will be responsible for the hotel chain's worldwide information systems, communications network and reservation operations. He will also direct the ongoing development and implementation of the information technology infrastructure for all Hotel Representatives, Inc. companies, including The Leading Hotels of the World, Prima Hotels and DataLead Communications, Inc.

Previously, Kubilus was vice president and chief information officer at BCM, Inc. in Pennsylvania. He has held similar posts at the Educational Testing Service and National Data Corp.'s Network Services Division.

Ameet Patel, 27, has been promoted to director of advanced technologies at **BASF Corp.**'s U.S. headquarters in Parsippany, N.J. He runs the 10-person advanced technology group, which explores how technologies can improve operations for the company. Previously, Patel was a senior project manager for emerging technologies at BASF.



RCI Management, Inc. in Corona, Calif., has announced the appointment of **Ron Ozga** as director of IS. Ozga has worked in IS at Baxter Healthcare Corp. for 19 years. Prior to that, he managed data center operations, operating systems software and database administration at Redken Laboratories, Inc.



Data Documents, an Omaha manufacturer of business forms and pressure-sensitive label products and services, has announced the appointment of **Charles L. Bauman** as vice president of

MIS. His responsibilities include directing all data processing activities and IS and developing internal and customer-related systems applications. Bauman has worked at Data Documents since 1986. He was previously director of MIS.



Rubbermaid, Inc. in Wooster, Ohio, has announced the appointment of **Michael E. Naylor** to the new position of senior vice president of operations. Previously, he was senior vice president of technology and environment at the company.

MCA/Universal in Universal City, Calif., has announced the appointment of **Michael Galella** as director of IS audit. He will report to Tery Reagan, vice president of corporate internal audit. Prior to the appointment, Galella was electronic data processing audit manager at MCA.



Micro Modeling Associates in New York has announced the appointment of

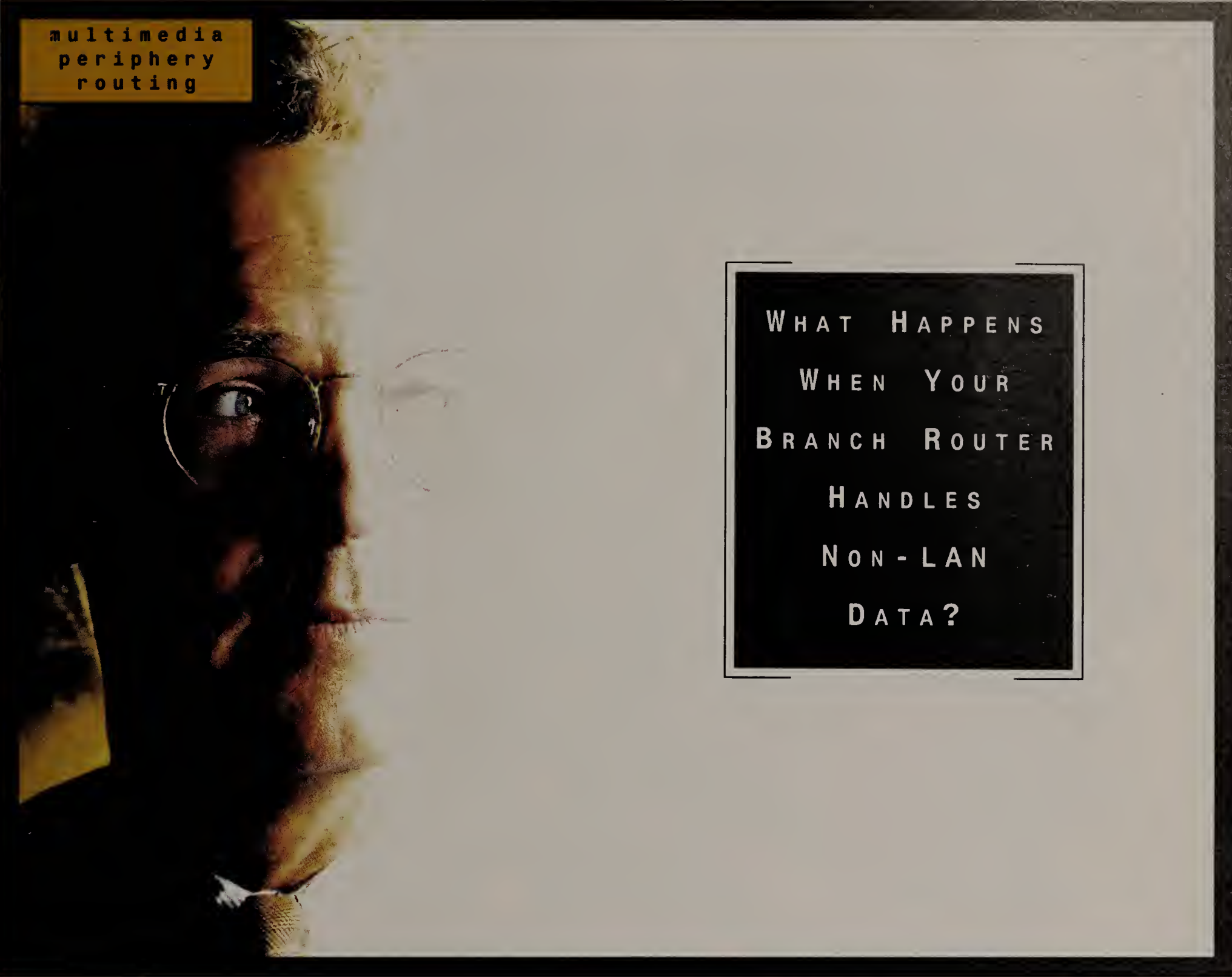
Michael B. Parker as president. Previously he was managing director at Bankers Trust Co., where he was responsible for all technology functions supporting the bank's derivatives, finance and advisory businesses as well as for setting future technology architecture and direction for the bank's financial services businesses.

Middlebury College in Middlebury, Vt., has announced the appointment of **Sam Ellis** as CIO. He will report to the college president.



Ellis will be responsible for developing a comprehensive vision and strategic plan for the use of information technology and for the creation of an enterprisewide technological infrastructure. He will oversee academic computing, administrative data processing, telecommunications, media services and library systems.

Ellis was previously associate vice president for information services at Portland Community College in Oregon. Prior to that, he was responsible for all administrative and academic computing at Clark College in Vancouver, Wash.



multimedia
periphery
routing

WHAT HAPPENS
WHEN YOUR
BRANCH ROUTER
HANDLES
NON-LAN
DATA?

® Motorola and MPRouter are trademarks of Motorola, Inc. © 1994 Motorola, Inc.

Something's missing with most branch routers. While they're good at routing LAN data, branches have to handle non-LAN data – what other vendors call “non-routable” protocols. Motorola's new 6520 MPRouter™ can route any branch traffic: IP, as well as SDLC, BSC, async and other legacy protocols. And it works directly with your data center's routers. Motorola, with Codex and UDS products, takes the lead. Again. Isn't it time you got the whole picture? Call for

a free brochure. 1 800 426-1212, ext. 510



Does a

BIGGE

marketing

... IDEO® allows you to develop applications for the growing number of platforms and databases in your

IDEO IS A TRADEMARK OF SAPIENS INTERNATIONAL CORPORATION N



Application Development Software

R department really make for a better product?

HYPE is a powerful thing. It can make the ordinary seem extraordinary. It can make products that have real limits seem desirable. And blind you to ones that can make you more productive. Hype can keep you from learning that Sapiens Ideo works with more platforms and databases than the application development products that you keep hearing about. (Platforms from mainframes and minis to Unix and Windows.[™] Databases from Oracle[®] and Sybase[®] to Informix[®]. Just to name a few.) Hype can make you think that something developed to work with what you have now is an acceptable product. And make you forget how quickly your environment changes. Hype can make you ignore Sapiens Ideo and sell you on products with high-priced marketing budgets. Hype is like that.

changing client/server environment. Not just the ones you have now. For information, call 800-230-IDEO.

Intelligence Files

Getting better with IS

When it absolutely, positively has to be there overnight on time, midsize U.S. manufacturers are calling on information systems to help make it happen. As a result, many midsize manufacturers plan to make substantial capital investments in their order fulfillment and product delivery systems. The moves come in response to stricter requirements from large mass merchandisers and industrial companies.

According to a recent study by Grant Thornton, a consultancy in Boston, a majority of top executives at 250 manufacturing companies surveyed said they will spend at least 10% of their capital budget on one or more logistics and distribution functions in the next two years. Many of those respondents have dedicated simi-

lar budget resources in the past two years.

Large retailers and manufacturers are placing greater demands on midsize manufacturers for immediate turnaround on orders to ensure that their customers get products immediately. To comply with this "I want it now" mandate, midsize manufacturers are relying more on technology investments to speed and improve the efficiency of these functions.

Areas of capital investment planned by midsize manufacturers for the next few years include material-handling equipment, 27%; automated data collection systems, 25%; electronic data interchange, 25%; and updates to warehouse information systems, 16%.

Little bang for the buck

The payback on IS investments is still dismal, according to major automotive suppliers. That is the conclusion of a recent survey of chief information officers and IS directors by Deloitte & Touche's

Management Consulting Group in Detroit. The survey participants represented large automotive suppliers with an aggregate \$30 billion in annual sales and more than 150,000 employees at 500 plants.

The respondents said despite making sizable investments in IS, they are still plagued by a failure to communicate. A major culprit: platform inconsistency, which prevents the use of common standards or easy sharing of information.

The survey found a wide range of systems supporting different corporate functions: IBM mainframes largely supporting administration and finance; mid-range proprietary systems supporting manufacturing; and Unix-based workstations supporting engineering functions and PC LAN networks in sales and marketing.

The survey also found that the pressure users put on IS to meet existing business needs is forcing IS to often leap before it looks. In many cases, IS organizations are rapidly building architec-

tures to integrate new technologies, leapfrogging from older to newer technologies that may not be well defined.

The client/server calling

Client/server continues to be the topic most on the minds of IS executives, according to a poll of attendees at the Society for Information Management's recent annual conference in Salt Lake City. Attendees were asked to identify the "five most critical topical areas affecting the IS industry in the next five years."

The top issues identified included client/server and distributed processing; retooling the IS workforce; global and interenterprise information interchange; object-oriented technologies; business process re-engineering; information technology and change; measuring the value of IS; integration of IS with the business; the virtual corporation; multimedia; learning organizations; and speeding up and lowering the cost of applications development.

DEC. 4-10

BGS Systems Users Group Meeting. Orlando, Fla., Dec. 5 — Topics: Visualizing multiple systems, subsystems and networks, BGS process and products for managing distributed Unix systems and real-time management. Contact: BGS Systems, Waltham, Mass. (617) 891-0000.

Developing an Outsourcing Strategy: Balancing Internal vs. External Sourcing. Boston, Dec. 5-6 — Charles Ansley, vice president of IBM's Integrated Systems Solutions Corp., will speak on "The Information Technology Outsourcing Industry — Its Dynamics." Benny Popek, director of Coopers & Lybrand, will discuss "Directions and Transitional Outsourcing Strategy for the '90s." Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

IT Services '94: The Information Technology Services and Support Conference and Exposition. Santa Clara, Calif., Dec. 5-7 — Contact: Creative Expos and Conferences, Inc., Walpole, Mass. (508) 660-7099.

DB/Expo '94. New York, Dec. 5-9 — Contact: Bruno Blehheim, Inc., Fort Lee, N.J. (201) 346-1400.

Wireless Datacomm Fall '94 Exposition and Conference. Washington, Dec. 6-8 — Admission: \$495 for a one-day session, \$895 for two days or \$1,095 for three days. Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Fall Internet World '94. Washington, Dec. 6-9 — James Clark, chairman and chief executive officer at Mosaic Communications, Inc., will give the keynote address: "The Internet is the Information Highway." Fees: \$445 if registering before Nov. 22, \$495 after Nov. 22. Contact: Mecklermedia, Westport, Conn. (203) 226-6967.

Database & Client/Server World. Chicago, Dec. 7-9 — Conference will run in conjunction with the 5th Annual Rdb World, the EDA Solutions Summit, the RM25 Silver Anniversary Conference and the Executive Client/Server Conference. Contact: Digital Consulting, Inc., Ando-

ver, Mass. (508) 470-3880.

The National Center for Database Marketing. Stamford, Conn., Dec. 7-9 — Also being held Dec. 8-10 in Orlando, Fla. Contact: Margaret Launzel-Pennes, National Center for Database Marketing, Stamford, Conn. (203) 358-9900.

Network Storage '94. Santa Clara, Calif., Dec. 8-9 — Contact: Peripheral Strategies Conference Information, Santa Barbara, Calif. (805) 569-5610.

DEC. 11-17

Shaping Government for the 21st Century. Phoenix, Dec. 11-14 — The symposium will focus on how to improve the delivery of public services and explore new ways to respond to the public's

increasing demands. Topics will include roles of the citizen. Keynote speaker is Peter Senge, author of *The Fifth Discipline: The Art and Practice of the Learning Organizations* and *The Fifth Discipline Fieldbook*, will discuss the importance of organizational learning to ongoing success. Contact: City of Phoenix, Phoenix, Ariz. (602) 262-4714.

Project World Conference & Exposition. Santa Clara, Calif., Dec. 12-16 — There will be 12 pre-conference workshops, including programs by the Tom Peters Group and Deloitte & Touche; five keynote sessions, featuring the latest discoveries in technology; 114 expert presenters, more than 80 exhibit booths highlighting the latest in project management groupware and software. Two-day admission to exhibits and keynotes is \$25. Contact: Center for Management Research, Wellesley, Mass. (617) 431-9797.

Learning from the best

Managers who want to learn how award-winning companies achieve success and learn from their mistakes along the way may want to attend the 1994 International Baldrige Conference, sponsored by the International Institute for Learning, Inc.

The conference will be held at the Sheraton New York Hotel & Towers in New York on Dec. 8-9. The theme is "Lessons Learned and Benefits Gained by Implementing the Baldrige Quality Award Criteria: From World Class Leadership to Customers as Partners."

Conference speakers will include senior executives from this year's Baldrige Award-winning companies

as well as from companies that did not win the award but are benefiting from using the Baldrige process. Among the topics covered will be leadership, benchmarking and empowerment.

Keynote speakers will include Charles W. Szulik, vice president of process leadership at Ford Motor Co.; Christopher Carey, president of Data-tec Industries; and Phil M. Scanlan, vice president of AT&T Corporate Quality.

For additional information or to register for the conference, call Lori Milhaven or Amy Gershen at the International Institute for Learning in New York at (800) 325-1533 or send a fax to (212) 909-0558.

JAN. 1-6, 1995

Macworld Expo. San Francisco, Jan. 4-7 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-2001.

JAN. 15-21

First Annual Mobile Communications '95 Conference. Dallas, Jan. 16-18 — The conference will address North American, European and Pacific Rim regions, marketing strategies used in these regions and regulatory and legislative matters aimed at mobile equipment vendors and service providers. Contact: Frost & Sullivan, Inc., Santa Clarita, Calif. (800) 256-1076.

1995 Usenix Technical on Advanced Computing Systems. New Orleans, Jan. 16-20 — Contact: Usenix Association, Berkeley, Calif. (510) 528-8649.

SoftExpo '95. San Jose, Calif., Jan. 17-19 — The conference will focus on business and technical issues facing software companies. Sessions include product development, marketing and sales, technical support, customer service, translation or "localization," finance, licensing, packaging and manufacturing. Contact: Mark Cramer, Expomasters, Englewood, Calif. (303) 771-2000.

Mobile Outlook on Communications and Computing. Atlanta, Jan. 18-20 — The focus areas of the three-day conference will include the following: How to integrate mobile systems into a fixed computing environment, how much of what is now in place must change to permit remote access, how and when to make required hardware and software modifications and why do some promising pilot programs succeed while others fail. Contact: David A. Kaminer, Kotch & Poliak, Inc., New York, N.Y. (212) 486-6186.

JAN. 29-FEB. 4

Special Libraries Association 1995 Winter Education Conference: Managing Information Technology. Raleigh, N.C., Jan. 29-31 — Contact: Special Libraries Association, Washington, D.C. (202) 234-4700.

EXTREME PROBLEMS DEMAND EXTREME SOLUTIONS.

KILLER SOLUTIONS FOR CLIENT/SERVER WORKFLOW FINANCIALS.

Although there are promising silver bullet solutions to even the most extreme financial management problems, believing that they go far enough in technology and functionality will leave you with lots of sleepless nights.

SOFTWARE WITH A VISION: INFORMATION VS. DATA

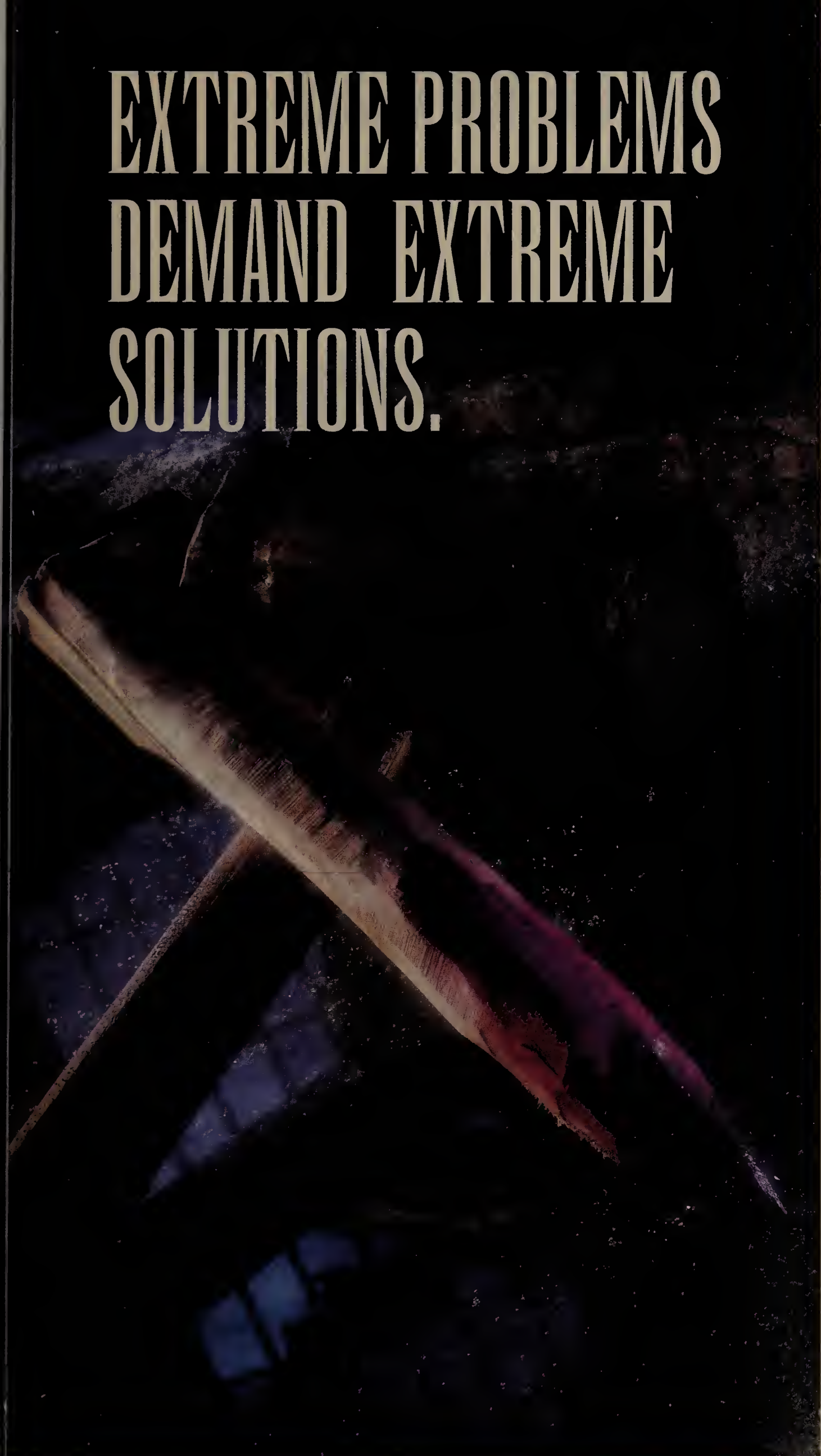
Like many Fortune 1000 customers of our 2nd generation client/server workflow financials, you have a strong vision for your business, your department, your job. You think today's applications should match all elements of your job, and deal with all forms of information. This should include data that's structured and unstructured, high-value and low value, stored or in-transit, inside applications or on the desktop.

It should also handle data in electronic, microfiche or source image form. You believe that these applications should do more than mere transaction processing and perform the business process tasks you perform. Like the 'walking' from desk to desk, the 'opening' of file cabinets, the 'reaching' into microfiche or printed report records. You know that this is the only way to get true competitive advantage based on total information management.

ADVANCED ARCHITECTURE FOR AN ADVANCED VISION

Only Computron delivers such 2nd generation client/server workflow financials, marrying advanced client/server technology and distributed objects with proven high-power functionality for every UNIX and legacy server, client and database (Oracle, Sybase, etc.). A recent survey by IDC lists Computron as one of the top five client/server accounting software companies in worldwide revenues. And we are the first to deliver high-impact technologies like workflow/image and COLD, while others are still talking about strategy.

So call about our "Killer" solutions or for our free white paper, "Financial Software... Client/Server and Beyond".



computron

FINANCIAL, WORKFLOW/IMAGE AND COLD SOLUTIONS

800-828-7660

Re-engineering the Workplace

**Special
Quarterly
Report**

While helpful, the new wave of business process re-engineering software could use some redesign of its own

Tool Time

By Joseph Maglitta

R

e-engineering is supposed to start with a clean sheet of paper. Yet anyone who's wrestled with roomfuls of marker-smeared charts or tried to diagram, say, a wild order-entry process using CASE tools knows that business redesign can quickly get very messy.

Derek Miers, a British re-engineering consultant, tells of a chemical giant whose 60-foot diagram of its North American sales process required its own seat

on a jumbo jet. No wonder many frustrated re-engineers are ready to tear out their hair and tear up their process charts. But hang on.

In the past year, a wave of new software aimed at business process re-engineering (BPR) has hit the market. Big names such as IBM,

Texas Instruments, Inc., Xerox Corp., Software AG of North America, Inc., Digital Equipment Corp. and AT&T Global Information Solutions have introduced affordable business mapping, analysis or redesign products.

So have dozens of smaller firms, including Logic Works, Inc. in Princeton, N.J., KnowledgeWare, Inc. in Atlanta

and AdvanEdge Technologies, Inc. in Tualatin, Ore. Moreover, workflow vendors, computer-aided software engineering (CASE) vendors and even artificial intelligence sellers are enhancing their products to grab a share of the \$40 billion that will be spent on re-engineering services this year. The market seems ripe.

"Two years ago, people had the patience and dollars to throw at re-engineering. Now it's getting a bad name," says Timothy R. Furey, a principal at Oxford Associates. The Bethesda, Md., re-engineering consultancy counts General Electric Co., Johnson & Johnson and IBM among its clients. "If you're going to embark on a re-engineering

project, you'd better get a payback real quick," he says.

And vendors say their products — bearing names such as BPwin, Business Design Facility and Process IT — are just the ticket for making re-engineering faster and more organized. The approaches and capabilities of products and vendors vary widely. But sales pitches are the same: "Don't obliterate — automate."

Want to know, for example, how that credit-card application gets made in your firm? Sit down at your PC, connect some icons and symbols and watch the paper start flying around. You might find yourself exclaiming, "Damn, are we screwed up!"

Most products, which typically run on PCs and workstations, cost from \$500 to \$10,000 per seat. High-end packages let you do modeling, analysis, simulation and animation.

Only about 20% of re-engineering efforts use such tools, estimates Delphi Consulting Co. in Boston. But the products are hot. Several ses-

sions on the topic at the Gartner Group, Inc. annual symposium last month drew packed crowds. BIS Strategic Decisions in Norwell, Mass., plans a four-day conference in February on BPR and workflow tools. Various Internet forums are buzzing with requests for information on the topic. Europeans seem especially excited.

Why not? Boosters claim BPR software may provide the long-missing link between information technology and business strategy. Imagine: A new process is mapped, then turned into code. There's no question if the right development job is getting done. Instant alignment.

No wonder a growing number of organizations — including Ford Motor Co., Reebok International Ltd., Mobil Corp. and many others — have snapped up the products. For many, the tools may offer the first clear view of the complex web of people, processes and technology that make up their organization.

Users say that besides



ROB SAUNDERS

A crowded field

Gartner Group says the fast-changing market for business process analysis and simulation tools will continue to evolve quickly over the next year. The groupings of the representative vendors listed below shift almost daily, as new players and factors alter the market.

STRONG EXECUTION

- Popkin Software & Systems, Inc.
- Texas Instruments, Inc.
- Antares Alliance Group
- Gemini Consulting Services, Inc.
- Andersen Consulting

GOOD VISION

- ICL TeamWare, Inc.
- Meta Software Corp.
- Scientific & Engineering Software, Inc.
- LBMS, Inc.
- CACI Products Co.
- High Performance Systems, Inc.
- Interfacng Technologies Corp.

NICHE PLAYERS

- Digital Equipment Corp.
- Hewlett-Packard Co.
- Sterling Software, Inc.
- Logic Works, Inc.
- Action Technologies, Inc.
- ViewStar Corp.
- IntelliCorp, Inc.
- Various AI, CASE and workflow vendors

Source: Gartner Group, Inc., Stamford, Conn.

clearly illustrating "as is" and "should be" views of processes, BPR tools can help lower the notoriously high rate of re-engineering failures. How? By promoting better communication among team members and sponsors.

"These tools are great for helping people not involved in the process, such as the steering committee, understand what's going on," says David E. Thomas, a process redesign engineer at Nation's Bank Services, Inc. in Charlotte, N.C. When it's time to share results, Thomas simply zips process charts made in Micrografx,

Inc.'s ABC FlowCharter over CC:Mail or imports them into Excel for presentations.

Some products are breathtakingly detailed: Andersen Consulting's object-based mapping tool, for example, provides a multi-dimensional look at people, processes, products, corporate strategy, core competencies, regulations and information technology. (It's so powerful that Andersen considers it a competitive weapon and restricts its use to company consultants.)

Managers of huge re-engineering efforts need all the Tool time, page 101



“What you
need for
client/server
is a partner
who’s
animated.”

Another IBM Client/Server Success.

Warner Bros. Studio Stores are opening about as fast as a...beep beep...*Roadrunner*, and a big part of their business is original artwork, or eels, from Warner Bros. cartoons.

“No two production eels are alike, yet each one has to be available in all of our 100 stores, simultaneously,” says Karine Joret, Vice President, Worldwide Marketing.

What Joret needed was a client/server system that could 1) display eels in perfect detail, 2) be easy enough for any user, 3) make it impossible for two customers to order the same eel and 4) integrate smoothly with their existing point-of-sale system.

“We also needed a vendor who really knew retailing and could do the entire job, at our speed. It was IBM.”

What IBM created is an OS/2®-based multimedia system with touch-screen PC clients in stores and a server in Burbank, all tied in to a RISC-based network for point-of-sale. IBM wrote the application software and helped build facilities for digitizing images at the Warner Bros. Studios.



Karine Joret
Vice President
Worldwide Marketing

“Now,” says Joret, “instead of flipping through photocopies, customers browse on a screen, and the instant a eel is bought it’s pulled from the system, even as other customers browse in other stores. It’s exactly what we asked for.

“As upcoming animated films, such as the *Roadrunner*’s ‘Chariots of Fur,’ create more demand for our products, our business grows and our needs change. IBM is always right there with us; I can’t tell you how helpful that is.”

It’s another side to client/server IBM takes seriously: that you’re the client, and we’re the server. Call us and you’ll see.

That’s all folks.

For more information about IBM Client/Server, ask for extension “star” 802 at

1 800 IBM-3333.



mother

ALWAYS **KNEW YOU WERE
A GENIUS**



PROVE HER RIGHT. Call 1-800-829-4143 now for your free Windows World Open Entry Kit.

Blow the judges away with your Microsoft® Windows™ custom application. Display your ingenuity for creating an application that's streamlining the way your corporation or organization does business. Get showered with recognition from your peers. Participate in an awards ceremony featuring Bill Gates and other industry luminaries. Then call home and tell mom thanks for keeping the faith. Find out more by calling for your free Entry Kit today.

But hurry, the entry deadline is January 23, 1995.



COMPUTERWORLD

Microsoft®



COGNOS

WALL

FORTUNE

healthcare

**REAL ESTATE TODAY
REALTOR NEWS**

Windows World Open is held at WINDOWS WORLD in Atlanta, April 24-27, 1995.

The Windows World Open Entry Kit contains all details and rules for this contest. Contest is void where prohibited by law. No purchase necessary. Computerworld, Inc. is an IDG Company. Windows, Windows World and the Windows logo are trademarks of Microsoft Corporation. Windows World and the Windows logo are used by INTERFACE GROUP - NEVADA, Inc. under license from Microsoft. All other trademarks are the property of their respective owners.

Special Quarterly Report

CONTINUED FROM PAGE 97

perspective they can get, says Stefan Rollwage. He should know. Rollwage is director of electronic procurement and settlement systems at Public Works and Government Services, Canada's equivalent of the U.S. General Services Administration. His 100-member team is using First Step from Interfacing Technologies Corp. in Montreal to help re-engineer all federal purchasing in Canada. "The ability to zoom from macro view to atomic process is a big plus," Rollwage says.

And BPR tools are not just for re-design. Advanta Business Services, a Voorhees, N.J.-based unit of Advanta Corp., used Workflow Manager from Action Technologies, Inc. in Alameda, Calif., to design a new credit-card processing application in just four months, says Tom Nicolai, director of MIS.

"For a long time, all we had was languages," he says. "We're really keen on development tools that give us an edge." The pilot worked so well that Nicolai plans to use the product to create a new leasing application for 200 users.

Missing links

Despite its strengths, BPR analysis software is hardly a packaged panacea. Many products are still immature and could pose big headaches for information systems professionals charged with turning hundreds of colorful diagrams into workable code. "These tools are not as useful as people would like them to be," says Delphi Vice President Carl Frappaolo.

Even vendors admit that links from diagnostic and charting tools to production tools — such as workflow software, databases and client/server development tools — could stand lots of improvement. Many users agree.

"Once the process piece gets pinned down, you can't necessarily generate code by exporting flow and sucking it into a CASE tool," says James T. LaPointe, director of process re-engineering at Reebok. "The linkage is relatively weak today." Not surprisingly, TI, ICL TeamWare, Inc., Information Builders, Inc., IBM and other sellers of CASE tools offer the strongest — though not ideal — hooks.

Of course, many "major [user] companies don't want to produce code using a re-engineering tool because they are implementing standard software like SAP, R/3 or Cincom," says Klaus J. Hagenlocher, a re-engineer at Ciba-Geigy AG.

"But they need to know if the processes, events, functions, organizations and data they have are covered by the standard software."

Arvin Lyon, a senior consultant at Martin Marietta Corp.'s IS division and an expert on BPR tools, says many low-end packages can't handle big, companywide re-engineering efforts. "One of their weakest points is the inability to handle large flows. You need an ability to look at lots of layers."

Moreover, most commercial BPR packages run on a stand-alone workstation, so they cannot be used over networks. That's fine if you have a half-dozen re-engineers locked in a conference room at headquarters. But what if your 200 team members are in Houston, London and Saudi Arabia?

Such reusability is key, says Robert Seltzer, president of Meta Software Corp. in Cambridge, Mass. "People do not buy a one-time application. They view re-engineering as a continuous activity." Like many vendors, Meta is working furiously on partnerships and product hooks that will permit enterprise use.

What about ABC?

Another possible drawback: Few tools currently being sold provide built-in metrics for Total Quality Management. Ditto for built-in support of Activity Based Costing (ABC), an upcoming accounting technique.

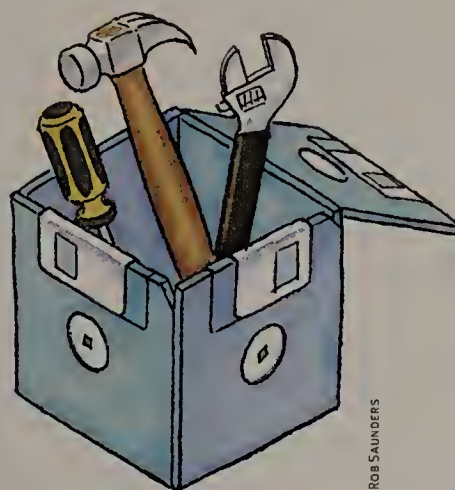
A more basic problem, notes Gartner Group consultant James Bair, is that BPR tools are poorly equipped to map reality. "They are pretty linear and very structured, especially workflow. That is antithetical to continuous change."

Training is also an issue. All but the simplest packages may require big investments of time. John Veleris, senior manager of process improvement projects at Grant Thornton, a Chicago consultancy, complains: "A lot of these tools are very cumbersome to use. They're something like a sophisticated CAD application. Some have a lot of baggage from DOS applications, and they're not that user-friendly." Integration Definition Method, a popular Air Force-developed standard, gets an especially bad rap here (see story at right).

If you do manage to make tools work, there's another potential snag: overuse. Vendors and users agree there's a big temptation to spend too much time mapping processes and not fixing them.

"Re-engineering teams will spend three, four, five months trying to map the process in detail. They'll get tricolored, three-dimensional maps, and they'll be very proud. People find a lot of comfort in analysis," Furey says.

Tool time, page 105



Rob Saunders

Tools, tools, tools

Process Product Watch

An exhaustive, independent research service that road-tests BPR and process-oriented tools. Subscribers in 11 countries include Deloitte & Touche, Perot Systems Corp., Olivetti USA and Digital. Produced by Enix Ltd. in Surrey, England. One-year subscription, four reports, \$1,800. Fax: (011-44) 81-940-7424. E-mail miers@co.uk. Phone: (011-44) 81-332-0210.

Business Process Re-engineering Mailing List

Delft University of Technology

Dial into this active Internet news group and you'll find plenty of talk about BPR tools, methods, is-

sues, you name it. Heavy international flavor brings in diverse views and resources. To subscribe, send E-mail to: listserv@is@twi.tudelft.nl. Type in INFO BPR-L to obtain info letter.

The Re-engineering Handbook

Raymond L. Manganelli, Mark M. Klein. \$29.95. Amacom, New York, N.Y., November 1994.

This "step-by-step guide to business transformation" includes a good chapter on BPR tools.

"Systems Re-engineering Economics"

June 1994. Eight-page newsletter focuses on workflow software and data-access tools. For more information, call (619) 438-8100.

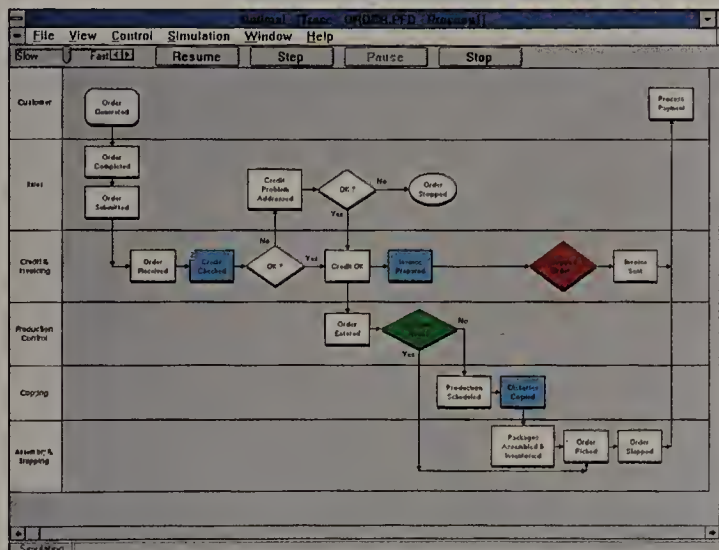
Gartner Group Annual Symposium

Several audiocassettes and conference notes from recent conference address BPR tools.

Day 1: BPR Scenario, AI Case; Day 2: Workgroups and BPR, Regina Casonato; Day 4: Technologies and Methods, AI Case; Workflow and BPR, James Bair; Day 5: Methods, techniques and tools, Kelly Simpson. For more information, call (203) 363-7150.

IT Business Process and Workflow Conference

Feb. 18-22, 1995. Orlando, Fla. — Contact: BIS Strategic Decisions (800) 974-9980, Ext. 178.



Optima from AdvanEdge Technologies is among dozens of BPR tools reviewed by Process Product Watch

IDEF: Familiar but how friendly?

Depending on who you ask, Integration Definition Method (IDEF) is either the future or the past of business-process mapping.

Developed by the U.S. Air Force in the 1970s, IDEF is a structured modeling, analysis and design technique.

Today, IDEF has migrated to banking, manufacturing and service industries. IDEF training and consulting is offered by dozens of consultancies. Numerous vendors, including CACI Products Co., Dynamics Research Corp., Meta Software, Inc. and Popkin Software & Systems, Inc., sell IDEF-compliant products. There's even an active user group. For \$75 a year, corporations can tap into a network of advice, conferences, exhibits and tutorials.

Loyal backers defend IDEF as inexpensive and straightforward. "We use IDEF because [it] has a standard and rigor and is

used internationally," says Seymour Samuels, a spokesman for SRA International, a software vendor in Arlington, Va. And IDEF is easy to teach and learn, adds Christian Knoll, a professor at the German Institut fuer Fertigungstechnik.

Critics, however, complain that IDEF is too hierarchical, I/O-oriented, nongraphical and hard to use. IDEF's rigor is also its downfall, says Derek Mier, president of Enix Ltd., a consultancy in Surrey, England.

"The rigor gets in the road early on in the BPR process," he says. "Almost without exception, the uninitiated find it particularly confusing."

Analysts say it's too early to tell how well IDEF will do commercially. "IDEF is a dark horse," says Albert F. Case Jr., vice president of application development strategies at Gartner Group. — Joseph Maglitta



The New Compaq Contura 400CX



© 1994 Compaq Computer Corporation. All Rights Reserved. For more information on the new Contura 400 family, call PaqFax and request document #4033. 1-800-345-1518. Compaq, Contura and INRTUBE are registered U.S. Patent and Trademark Office. Call the Compaq Customer Support Center for details on our 3-year limited warranty. Some restrictions may apply. Battery packs and certain options are covered by a one year warranty. Docking base optional. The Intel Inside logo is a registered trademark of the Intel Corporation.

Wouldn't life be easier

with a detachable handle,

a brilliant color screen,

a free 3-year warranty,

an upgradeable 486 processor,

a center-mounted trackball,

a full-sized keyboard,

two little adjustable feet,

the versatility of two PCMCIA slots,

a battery you could buy almost anywhere,

all in an affordable, 5.9-pound package

that glides into a desktop docking base?

We thought so.

COMPAQ

**CHOOSE THE
WRONG MIDDLEWARE
AND THIS
COULD BE YOUR NEXT
OFFICE.**

Although there's a growing number of vendors who claim to provide middleware solutions, choosing the wrong one could have disastrous results for you and your company.

Most middleware vendors provide only limited solutions. Access to only certain databases and computer systems, limited support for new emerging standards, restrictions on network protocols and new deployment platforms. Choose one of these vendors and your open computing environment today will become your closed environment tomorrow.

INTRODUCING EDA/SQL® RELEASE 3

Information Builders' new **EDA/SQL Release 3** gives you the flexibility to set your own standards for truly open client/server computing... both today and in the future.

Whether you want to retrieve, join or update data, we guarantee transparent SQL access to virtually any database – both relational and legacy – across more than 35 computer platforms. We support more

front-end tools than any other middleware vendor and let you choose from today's most popular communications options. We provide copy management facilities for replicating data located in over 60 file formats. And we offer complete compliance to new and de facto open standards such as ODBC, DB-Lib, X/Open, and DCE.

EDA/SQL Release 3 gives you unrivaled performance for OLTP and DSS applications. Special query optimization features provide fast, efficient distributed processing. And our unique **SmartMode™** option prevents expensive runaway queries. Best of all, **EDA/SQL Release 3** comes with a new pricing structure that offers the best price/performance value in the industry.

Bottom line, **EDA/SQL** middleware is the only choice for open client/server computing today and tomorrow. The other choice... how about an open office?

For more information, to attend a **FREE** seminar or to receive a **FREE** White Paper, "Migrating to Client/Server - A Case for Middleware",

CALL 800-969-INFO

In Canada Call 416-364-2760



"There's no middle ground on middleware"

**Information
Builders**

Special Quarterly Report

CONTINUED FROM PAGE 105

When that happens, says William Stoddard, managing director of Andersen Consulting's re-engineering practice, companies risk wasting all their time and money "revealing to management how screwed up things are." He and others advise focusing on key processes and using good judgment about how much mapping is enough.

Users and consultants acknowledge that even the best tools used properly won't banish the pressures that scuttle many BPR projects. They might even worsen them by clarifying turf lines.

Ultimately, it's hard to tell how useful BPR software will be. Fans agree the products are better than paper. And companies are understandably hesitant to talk about failures, so user reviews may seem overly upbeat. Still, some cultures will always prefer the simplicity and scope of paper diagrams.

Change for the better

During the next six months, the product picture may improve. Numerous vendors say they plan to release new products and major upgrades. Many will employ object technology and support Object Linking and Embedding and Dynamic Data Exchange.

This week, Andersen Consulting plans to unveil an upgrade of its proprietary PC-based software. The Value Driven Re-engineering Workbench will include performance measures such as elapsed time, cycle time, labor time and costs. It targets 40- to 50-member teams.

The Antares Alliance Group, a joint

venture between Amdahl Corp. and Electronic Data Systems Corp., plans to unveil BPR software next year that includes Gateway Consulting's redesign methodology. Oracle Corp. and others are also said to be readying new BPR products. Meta Software is working to develop data repositories for reusable BPR models as part of a \$60 million federal project. AT&T, IBM and Oracle are also part of the effort, which is aimed at creating enterprisewide workflow management for

health care.

The brightest hope comes from a fast-growing standards body. The Workflow Management Coalition, begun by IBM in Europe and now boasting 100 members, has begun developing specifications for an interface that will link business process models into workflow tools and engines. A working draft was issued Aug. 3.

Bair is optimistic. "This could really solve the problem of an enterprise."

Even if that occurs, experienced hands

stress that good people, not software, make or break re-engineering.

"If your team lacks imagination or the bravery and capacity to innovate, then the use of computerized tools will do little more than provide interesting diversions," Miers warns.

Lyon is more blunt. "A fool with a tool," he says, "is just a faster fool."

Maglitta is a *Computerworld* senior editor, Corporate Strategies.



Tips from the battlewise

Re-engineers, vendors and consultants offer some simple advice for buying and using BPR software:

- **Take a good look at links to software development, groupware, databases and other tools.** Most products will support only a couple, if any.
- **Match the tool to the job and users.** Are you doing simple process redesign or full-blown re-engineering? How much power do you need? Can you get by with simple flowcharting or workflow software, or do you need heavy-duty simulation and animation? Will it be used by re-engineering team members, IS people or end users?
- **Start small.** Try a small pilot before you tackle your nightmare process or redesign all 1,400 of your international locations.

NATURAL New Dimension: Breaking barriers.

Giving your all. Pushing yourself to the limit. And beyond.

The goal:

To compete at the highest level. And leave your rivals behind.

The means:

World-beating information technology. Enterprise-wide client-server solutions of limitless power. Forging links between each and every platform. Between desktop PC, UNIX and mainframe.

The prize:

NATURAL, the 4GL from SOFTWARE AG. Its PC component NATURAL ND gives you

the strength to push yourself further than ever before. To break down barriers. And create genuine enterprise-wide information processing.

Because NATURAL ND is the first truly integrated, graphically supported development and runtime environment for mission-critical applications.

Push yourself further. And triumph.

SOFTWARE AG. Get in touch.
Call 1-800-423-2227.

SOFTWARE AG



**YOU CAN GET
16-BIT HIGH-END SOUND.
YOU CAN GET
16.8 MILLION COLORS.
YOU CAN GET
GOOD MORNING AMERICA.**

Some people really know how to wake you up. Namely, the engineers here at NEC. Introducing the new Versa™ M, a truly spectacular multimedia notebook computer.

Your multimedia applications will come to life with NEC's first-of-a-kind, photo-quality, 24-bit True Color screen which displays some 16.8 million colors. Or select the first-ever high-resolution 800 x 600 color display, or one of our enhanced TFT or DSTN screens. With each,

you get Versa's famous reversible screen.

Rest assured, the dockable Versa M comes



packed. It's powered by an Intel 486 DX/4 75 MHz or 100 MHz processor with 8 MB of RAM, up to 810 MB of hard disk drive storage, and 16-bit high-fidelity sound. It features the innovative VersaBay™ which is configured with a

removable 1.44 MB floppy drive that you can replace with any number of options. Like a PCMCIA Pak, giving you a total of four PCMCIA slots or a Video Pak, through which you can watch television.

And, as always, you get the reliability of NEC's UltraCare™ service program and three-year limited warranty. The news is Versa M. Call 1-800-NEC-VERSA.

**SEE, HEAR
AND FEEL THE
DIFFERENCE.™**

NEC

For information sent via fax, call NEC FastFacts™ at 1-800-366-0476 and request document Number 837726. Versa, VersaBay, FastFacts, and See, I hear and feel the Difference are trademarks of NEC Technologies, Inc. The Intel Inside logo is a registered trademark of Intel Corp. All other trademarks are the property of their respective owners. The Energy Star emblem does not represent EPA endorsement of any product or service. NEC GSA#GS00K91AGS5241

ENTRIES WANTED!



Entries wanted for ComNet '95 New Product Achievement Award.

Last seen by thousands at ComNet '94.

Known for spotlighting the best new products in the communications/networking industry.

Reward:

Maximum exposure at ComNet '95 for your new product launch.

The ComNet New Product Achievement Award recognizes the best and the brightest new products in the communications/networking industry. Over 40,000 industry professionals, analysts and press got a sneak preview of 250 new products announced at ComNet '94. We encourage you to apply and join the roster of New Product Hall of Famers like IBM, MCI, Optical Cable, Sun Microsystems and U.S. Robotics.

Enter the ComNet '95 New Product Achievement Award Competition and get maximum exposure for your product launch! You'll receive valuable pre-show, at-show and post-show exposure among our exclusive audience of attendees, press and analysts!

Only the best, newest, most innovative, most useful, groundbreaking products may apply. Call **800/225-4698** today for complete information and an entry form! **Deadline for entries: December 12, 1994.**

Awards will be presented in 9 categories representing the communications and networking market:

- Best New Transport Technology Product
- Best New Network Management Product
- Best New Carrier Service
- Best New LAN and Internetworking Product
- Best New Switching Technology Product
- Best New Infrastructure Product
- Best New Multimedia and Desktop Product
- Best New Wireless Product
- Best New Software and Applications Product
- And a Grand Prize to the Most Innovative New Product or Service

Who Can Apply? All ComNet '95 contracted exhibitors debuting a new product, product enhancement and/or product upgrade at ComNet '95 in Washington, D.C., January 23-26, 1995. Or a new product that has been announced within six weeks preceding ComNet '95.

The ComNet '95 New Product Achievement Award is proudly sponsored by

COMPUTERWORLD
the Newspaper of Information Systems Management

For more information on exhibiting, attending or speaking at ComNet '95, contact IDG World Expo at 800/225-4698 or 508/879-6700. For New Product Achievement Award information and entry form, contact Cress O'Brien at 508/820-8631. ComNet '95 is produced by IDG World Expo, 111 Speen Street, Framingham, MA 01701-9107.

AT YOUR SERVICE

by paul youngworth



*Got a system problem?
Top CompuServe systems
operators offer tips on
how to get your
problems solved on-line*

My first contact with CompuServe amazed me. I posted a desperate message in the PowerSoft Corp. forum after somehow positioning the PowerBuilder tool bar permanently off the screen. In less than an hour, I received two helpful responses and fixed the problem.

It doesn't always go that smoothly.

During a critical project in which I was fast approaching a deadline, I ran into a showstopping problem: The program ran fine in the PowerBuilder development environment, but the compiled version didn't perform a validation correctly. I turned to CompuServe in a panic.

I signed on to the Powersoft forum and posted a message with a header that read, "EXE doesn't work." When four days passed without an answer, I tried a different approach. I reposted my message, this time with a more specific header: "Embedded SQL won't compile." In a short time, I received three responses, one of which suggested moving the validation rule to a new part of the program. This solved the problem, and I deployed the application.

CompuServe can be a lifesaver. But there are hundreds of messages a day in some CompuServe forums. What's the difference between a question that gets 10 answers in an hour and a question that never gets answered?

CompuServe, page 110

Youngworth is a programmer/analyst at Schreiber Foods, Inc. in Green Bay, Wis. He is currently working with Oracle Corp. databases and Powersoft Corp.'s PowerBuilder to design systems for end-user access.

COMPU SERVE AT YOUR SERVICE

CONTINUED FROM PAGE 109

I asked forum experts and systems operators what is likely to make them stop and answer a question. Here are their top tips:

MAKE THE DESCRIPTOR

you put in the subject field sell the question. CompuServe members in a typical forum scroll through hundreds of messages. The first thing they come across is a one-line subject field that includes only a small amount of text. You only have a few words in which to persuade an expert to read the body of your message rather than move on. That's why it's important to be as descriptive and specific as possible in that line.

Putting general words such as "Help," "Problem" or "Bug" in the subject field guarantees that your message will be overlooked, says Frank Hamilton, a member of Team Powersoft, a group of PowerBuilder experts who volunteer to answer questions in the Powersoft forum. "You'd be surprised how many people post a message to the Datawindow section [of the Powersoft forum] with a subject of 'Datawindow question,'" Hamilton says.

POOR SUBJECT LINE: "Datawindow problem"

BETTER: "Edit mask won't display"

Dave Karow, systems operator for the Gupta Corp. forum, says the goal of the subject line is "to attract the subject matter experts to your note." If you're having problems getting PowerBuilder to connect to an Oracle Corp. database, say so in the subject. You've just increased the odds that a PowerBuilder or Oracle expert will read your note and pass by a note on the same topic with the subject line, "Connection problems."

You're competing with hundreds of messages. A well-worded subject line will let the experts know that your question is worth their time.

BRIEFLY SUMMARIZE

the problem or question in the first paragraph. You may have passed the first test and got someone to read your note based on your scintillating subject line, but your work isn't done. Forum experts say the most you can expect them to read before deciding whether to move on is about two paragraphs. Breck Carter, a consultant at Toronto-based Visual Systems Development Corp. and a member of Team Powersoft, calls this "cyberspace triage."

"If the first couple of lines mention topics I don't know anything about, I move on," Carter explains. "On the other hand, a favorite topic will grab my eye, and I will read on no matter what."

He says he sees some messages that contain pages of text, code and debugging traces "with a question hidden somewhere down in the body." His advice is to put two short sentences at the beginning that succinctly state the problem. "The point is to establish the context in the first paragraph," Carter says.

POOR OPENING: "We're building a manufacturing costing system that will have one record for each stock number we have. Under each stock number will be the detail for each bill of material item. To calculate cost we read the component table..."

BETTER: We want to design a PowerBuilder application that uses a Sybase stored procedure to find all the detail records associated with a master record. We are having problems connecting PowerBuilder to the stored procedure..."

PROVIDE ENOUGH DETAIL.

A well-designed opening paragraph will encourage experts to read on. However, if you don't provide enough detail, they might have to ask a bunch of questions before they can help. And they may decide it isn't worth the bother.

Unix forum systems operator David Moskowitz says he wishes he had a nickel for every time he has had to answer a question with a question of his own: "What have you tried? How are things configured? I assume you've done X?" Moskowitz says he's attracted to queries with as much detail about the problem as possible. "Tell the forum what you tried and the results," he says.

Powersoft systems operator Joe Mens

POOR APPROACH: Simply stating, "When my add record routine scrolls to the newly inserted record, it always triggers a validation error. What am I doing wrong?"

BETTER: List the error number and message text. Show the full validation rule. Include all the code you have placed behind the add button in the application.

agrees. Mens refers to this kind of informative explanation as "isolating the problem to a common denominator."

It's a good idea to detail your hardware and software configuration if it has a bearing on the problem. For instance, if you're having a problem on only two out of 30 systems, it's best to describe how those two are configured differently.

Be specific about error codes; give the code and error message text. Include brief snippets of code. Carter recommends cutting and pasting in actual code instead of making up an example. "Give us the real code [because] the problem might not be where you think it is," he says.

REPHRASE THE QUESTION

and post it again if you don't get the help you need.

If your note has gone several days without a reply, it doesn't necessarily mean no one can help you. If you feel you've been specific in the message header, that your message is detailed and that you've posted it in the right spot, the problem may actually be something out of your control.

Several forum experts say they only read messages that haven't yet received a reply. Because they are usually pressed for time, when they see a message with replies they assume the person has been helped. So they move on.

Therefore, if someone replies to your

message with, "I'm having that problem, too. I hope you get an answer," he may have reduced the chances of an expert reading your note.

Another factor affecting response is the forum's scroll rate. Forums have a fixed capacity for notes, and the lifetime of a message is based on a first-in, first-out order. In a high-activity forum, such as the Powersoft forum, the life of a message can be as short as three days.

It could be that the technical expert who can solve your problem or another user with the same configuration didn't sign on between the time you posted your message and the time it scrolled off the forum.

That's why it's a good idea for you to try sending you message again if you haven't heard anything in several days.

POST YOUR MESSAGE

in multiple forums. Let's say you've just purchased PowerBuilder and are having problems getting it to connect to your Oracle server. You have to find the proper connect string to use in PowerBuilder and may need to fine-tune parameters in Oracle and the network. This typically involves three separate products: PowerBuilder, Oracle and your network software.

A good strategy would be to post a message in the database management system section of the PowerBuilder forum (called "DBMS Connections"), in the connectivity section of the Oracle forum (go to the Oracle User Group forum section called "Networking") and in the appropriate section of the network vendor's forum, for example, the general business section of the Novell, Inc. Developer Information forum.

CompuServe offers access to industry experts, technical consultants and, perhaps best of all, information systems professionals who face the same problems you do. By knowing how to post messages that elicit helpful responses, you'll have this expertise at your beck and call.

BOY, I HATE THAT!

When using CompuServe to troubleshoot system problems, avoid posting your question in all sections of a forum. Several forum experts say they find this practice annoying, and it may actually reduce the chance of getting a response. Powersoft systems operator Joe Mens says multiple postings increase the rate that messages scroll off the forum, and such messages tend to get responses that "range from gentle guidance to outright hostility."



HIGHLIGHTS

In this issue, get the latest on special offers and product and service news along with details on Digital business solutions that are right for you.

Venturis line of desktop PCs

Ease of use, expandability, and upgradability in one great package

StorageWorks controllers

Details on new RAID and Write-Back capabilities

LinkWorks update

LinkWorks database alliances mean more selection and more savings

LeaseWorks'**AlphaBridge Option**

Your best route from VAX to the Alpha AXP platform

StorageWorks RW500 optical libraries

Automated, long-term storage at a lower cost per megabyte than online or attended offline storage

Digital takes you beyond the mainframe

Proven IT solutions that meet your business needs



The Venturis line of desktop PCs has something for everyone

Your users like its ease of use. Your MIS manager likes its configuration flexibility, easy setup, and networking interface compatibility. And with a starting price of just over \$1,000, you like the savings. We're talking about Digital's Venturis line of desktop PCs — eight new systems rich with features and packed with powerful enhancements.

Expandability and upgradability in an easy-to-use package

The key word here is easy. For businesses that need to deploy multiple PCs, the design of the Venturis slimline and full-profile systems makes them very easy to unpack, install, and configure.

What's more, the Venturis line incorporates features for maximum upgradability — so it can grow along with your business. These include:

- Memory (SIMM-based) that's expandable to 68 MB
- Zero Insertion Form (ZIF) OverDrive socket for easy and effortless upgrades
- Scalable CPU/secondary cache architecture
- Three ISA expansion slots and four device bays for slimline systems
- Certification for Microsoft Windows 95

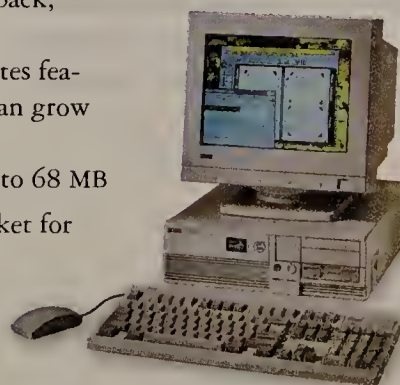
Add enhanced IDE on a local bus and accelerated graphics performance, and you've got a PC that's hard to beat price-wise and performance-wise.

But our engineers didn't stop there. In fact, they planned for just about everything you might want in an affordable desktop PC. For example, the Venturis comes with MS-DOS and Windows for Workgroups 3.11 preinstalled. Also incorporated are multiple levels of maximum system and user security. To top it off, our engineers integrated advanced power management features that offer reduced energy consumption plus lower computing costs.

What you need to do your work

For your users who keep busy with word processing tasks, spreadsheets, data entry, and E-mail, Digital's Venturis line of desktop PCs offers an unparalleled combination of advanced design and value-performance features.

Of course, this PC package comes complete with extensive network testing and certification, Digital's comprehensive service and support, and a standard three-year warranty.



For more information about or to order Digital's Venturis PCs, call

1-800-722-9332

LinkWorks database partner alliances mean choice, value, and savings for you

Through Digital's new strategic alliances with industry-leading database vendors like Computer Associates, Inc. and Oracle Corporation, we will package, sell, and service these popular database products together with LinkWorks. The LinkWorks/Oracle packages are available today; the LinkWorks/CA-Ingres packages will be available later this year. In addition, an alliance with Sybase, Inc. to package its Sybase System 10 with LinkWorks is in the planning stages.

How does all this benefit your business? Simply put, you get an easier, more cost-effective way to purchase LinkWorks.

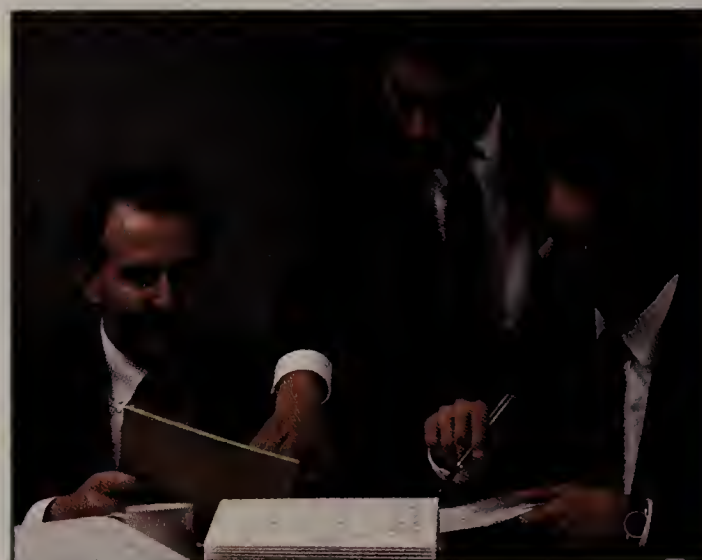
These expanded channels allow you to purchase LinkWorks in ways that are most convenient for you — with comprehensive service and support still provided through Digital's global Multivendor Customer Services organization.

Of course, the most important benefit is money in your pocket. Today, you can choose LinkWorks complete with ORACLE7 software at a cost savings of 44 percent over the total price of separately purchased components.

LinkWorks automates the ways people work together

For organizations needing maximum integration among desktops, workgroups, corporate systems, and production systems, LinkWorks software is the answer. As Digital's award-winning groupware solution framework, LinkWorks offers a revolutionary, object-oriented approach that lets you weave all the applications your users know and prefer into an integrated company-wide information system.

LinkWorks software enables your users to encapsulate applications and processes under familiar, object-oriented "icons," so they can readily share documents, drawings, spreadsheets, and databases; build workflows; and manage their information in a secure environment. For mail



Digital is making it easier than ever to purchase our award-winning LinkWorks software.

communications, the LinkWorks solution integrates several popular mail systems, such as TeamLinks Mail, cc:Mail, and MS Mail.

The LinkWorks solution framework approach maximizes productivity, creates a completely open applications environment that streamlines work flow, and restores real security to client/server systems.

For information on Digital's LinkWorks software,
CALL 1-800 DIGITAL
(1-800-344-4825) and reference JFS.

AlphaBridge Option: Your best route from VAX to the Alpha AXP platform

Direct to you from Digital Financial Services (DFS), LeaseWorks is a suite of flexible financing programs for today's technology. Its main objective? To provide you with unprecedented investment protection through a series of complementary financial tools.

One of these tools is the AlphaBridge Option — a program beneficial to VAX 7000 customers who face additional performance requirements. The AlphaBridge Option is a unique financing package that offers you the ability to utilize current VAX technology with the same low rates that are available for a DEC 7000 Model 700. This option allows you to finance a VAX 7000 Model 700 on a 36-month lease with a well-defined, optional Alpha AXP migration plan.

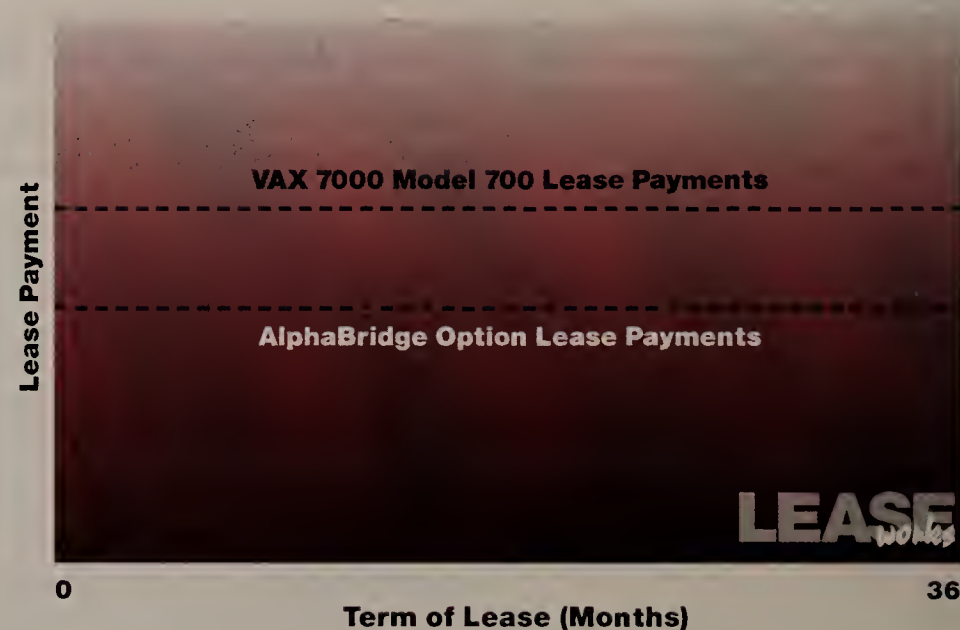
What's more, you can get all the VAX processing power you need today

and then move seamlessly to the DEC 7000 Model 700 system.

If you have questions, we have answers

The AlphaBridge Option from LeaseWorks protects your current investment in equipment, technical expertise, and software. Want to know more? Try these questions and answers on for size.

Can I include software products, peripherals, services, and other items in the original lease if I choose the AlphaBridge Option? Yes. You can



always include other items along with the CPU when leasing with DFS.

Does this option come with a specific time frame during which I have to upgrade to the Alpha AXP platform? No. You can upgrade to the DEC 7000 Model 700 AXP system at any time during the term of the lease.

What are my options at the end of the lease? You have three options at the end of the lease term. You can renew

Next for StorageWorks: RAID and Write-Back Cache

Now, all StorageWorks Array Controllers offer RAID and Write-Back functionality. If you need extended availability and higher performance from your storage systems, take a new look at Digital's family of Array Controllers. Today, you'll find RAID and Write-Back Cache options bringing enhanced functionality to all HSJ series, HSD30, and HSZ40 models.

Both of these features are supported by HS Operating Firmware (HSOF) V2.0, along with hot-swap for dual-redundant HSD30 models, expanded device support, and other operational enhancements.

RAID means data availability. Add RAID capabilities to our family of Array Controllers, and you'll get data availability approaching that of shadowing.

The AlphaBridge Option offers you a convenient, cost-effective way to migrate from the VAX 7000 Model 700 to the DEC 7000 Model 700. By applying Alpha AXP residuals to a VAX 7000 Model 700 lease, AlphaBridge provides customers with lower monthly payments than a standard 36-month VAX lease.

the lease, purchase the system, or return the system.

The best benefit? The AlphaBridge Option offers you lower monthly payments than a standard 36-month VAX lease.

For information on the AlphaBridge Option or any LeaseWorks program, call the LeaseWorks hotline at

1-800-343-3451

or mirroring, at a fraction of the cost. Digital's integrated implementation of parity RAID (levels 3 and 5) provides high data availability improvements across a broad range of application environments — both throughput and bandwidth intensive — without system manager intervention. Should a disk failure occur, you can get back up to speed quickly with dynamic substitution of a device from a designated spares pool.

Write-Back Caching brings enhanced response time
The Write-Back Cache option for StorageWorks Array Controllers employs nonvolatile caching for write operations, bringing an increase in I/O performance to most business applications.

Here's how it works: Digital's cache implementation now allows data to be written to a battery-protected 16 MB or 32 MB cache. This means applications can continue working rather than waiting for I/O write completions. By converting the total controller cache to

nonvolatile memory, the Write-Back Cache option with dynamic allocation allows both read and write operations to be cached simultaneously.

Together, more I/O performance
With both RAID and Write-Back Cache simultaneously deployed, you gain the I/O performance needed for today's storage-intensive operations, plus the fault tolerance of RAID.

Both the RAID and Write-Back Cache options can be ordered to meet your new storage subsystem requirements. Plus, all installed HSJ30/40/42/44, HSD30, and HSZ40 Array Controllers can be upgraded to incorporate these new StorageWorks subsystem features.

For more information on the StorageWorks family of Array Controllers, call
CALL 1-800 DIGITAL
(1-800-344-4825) and reference JFV.

Now playing on the jukebox: low-cost, long-term storage

Do you recognize yourself in either of these typical storage scenarios? You need to retain data for long periods of time to meet future business requirements. Or you need to store records securely to meet legal and audit requirements. In each case, your data storage requirements may be greatly outpacing your current technology, not to mention your budget. Is there an economical solution to these storage challenges?

The answer is yes. Digital's StorageWorks RW500 Optical Library

Systems offer economical nearline solutions for imaging, archiving, and storage management applications — at a significantly lower cost than either online storage or human-assisted offline media retrieval. At a glance, RW500 systems, also known as jukeboxes:

- Handle multiple applications
- Provide high data integrity and high system reliability



StorageWorks
RW534 Optical
Library

- Require no preventive maintenance

OpenVMS cluster support is also planned.

In addition, each system holds media cartridges and multi-function drives that support both rewritable and write-once/read-many (WORM) operations for maximum application flexibility.

There are several storage management products available for use with the RW500 series of optical libraries. These include Optical Storage Management Software (OSMS) for OpenVMS and POLYCENTER Hierarchical Storage Management (HSM) for OSF/1. The end result? You're offered a host of integration choices.

RWZ52 drives the RW500

The RWZ52 optical drive is identical to those products in the RW500 series of optical drives. With Optical Storage Desktop Software (OSDS), the RWZ52 provides rewritable and WORM support for OpenVMS VAX and rewritable support for OpenVMS AXP.

This drive is available either as a StorageWorks building block or as a tabletop device.

For more information on Digital's StorageWorks RW500 Optical Libraries, call
CALL 1-800 DIGITAL
(1-800-344-4825) and reference JFZ.

StorageWorks Desktop Backup/Archiver for PATHWORKS gives you more for less

Digital's StorageWorks Desktop Backup/Archiver for PATHWORKS LANs has always had the ability to initiate client backup, write and read data to and from tape or disk drives connected to an OpenVMS server, maintain backup schedules, and provide media management facilities. The best news? Now, with support for more platforms plus added features, the Desktop Backup/Archiver is even better than before.

Enhancements include a new graphical system management interface along with tape and disk backup capabilities for faster, easier file recovery. Plus, the StorageWorks Desktop Backup/Archiver for PATHWORKS runs on VAX and Alpha AXP systems and includes IBM compatible and Macintosh PCs as clients.

Don't risk losing your PC data

Remember, at most PATHWORKS sites today, 30 to 50 percent of your data is still resident only on users' PCs. That leaves those PC users at risk to losing critical data — and critical time, often with entire days spent re-creating lost files. StorageWorks Desktop Backup/Archiver can save data, time, and money — because it has the lowest cost per PC of any automatic backup product on the market.

Try before you buy

There's more good news. You can evaluate the StorageWorks Desktop Backup/Archiver for PATHWORKS at no cost or obligation for 30 days. Ordering now through February 15, 1995, will save you 40 percent on the StorageWorks Desktop Backup/Archiver for PATHWORKS starter kit for 15 clients.

Starter Kits

Order Number	U.S. List Price	New Price
QB-3AYAA-AA/JFU	\$495	\$295
QB-3AYAB-AA/JFU	\$495	\$295
QB-3AYAC-AA/JFU	\$495	\$295

To extend usage to your entire PATHWORKS LAN, add clients in these convenient increments:

Additional Universal Client Licenses

Order Number	Concurrent/Incremental License	Price
QL-388AL-3D/JFU	25 Universal clients	\$ 500
QL-388AL-3E/JFU	50 Universal clients	\$ 950
QL-388AL-3F/JFU	100 Universal clients	\$1,700
QL-388AL-3G/JFU	150 Universal clients	\$2,300
QL-388AL-3H/JFU	250 Universal clients	\$2,800
QL-388AL-3J/JFU	500 Universal clients	\$4,200

To order Digital's StorageWorks Desktop Backup/Archiver for PATHWORKS,

CALL 1-800 DIGITAL

(1-800-344-4825) and press 1. Reference StorageWorks Desktop Backup Program #900519. To try before you buy, press 2, and then press 9.

Do DECUS in December!

What: The Tradeshow at DECUS
When: December 12-14, 1994
Where: Anaheim Convention Center
Anaheim, California

Drop by Booth 100 to get the details on the StorageWorks family of Array Controllers, StorageWorks Optical Libraries, and all the other innovative StorageWorks products Digital offers.

"Of the client management applications we tested, PATHWORKS Desktop Backup topped the list."

Tim Sylvester
Digital News and Review Labs

Alpha AXP technology is the solution

Hughes selects Alpha AXP servers for multimillion-dollar move to open client/server computing

Price/performance, 64-bit scalability for future expansion, and standards compliance played key roles in Hughes Aircraft's decision to implement Digital's 64-bit Alpha AXP servers as the standard platform for its Enterprise Server Project.

The contract, estimated at \$20 million over the next two years, calls for the use of Digital's Alpha AXP servers running the DEC OSF/1 operating system. The servers will support a wide variety of business-critical applications including manufacturing resource planning (MRP), product data management (PDM), database, data warehouse, and communications applications.

Hughes' Enterprise Server Program is part of a major business reengineering plan. The plan includes development of flexible systems able to adapt with changing business needs through downsizing from centralized mainframe applications to distributed applications across an open client/server environment.

Southeast's largest dairy producer chooses Alpha AXP platform

Flav-O-Rich, Inc., the largest dairy products producer in the southeastern U.S., has announced it will upgrade its 11 processing facilities from VAX systems running the OpenVMS operating system to the Digital 2100 Server Alpha AXP platform. The company recently signed an agreement to purchase Datalogix's GEMMS (Global Enterprise Manufacturing Management System) process manufacturing software solution running on the Alpha AXP platform and DEC OSF/1 operating system.

GEMMS is the first open system, client/server solution designed specifically for larger process manufacturers that require multiplant, multidivision, and multiview capabilities. It is currently in use at more than 50 sites, including such Fortune 500 manufacturers as Heinz Pet Products, PPG Industries, and AlliedSignal.



DIGITAL

Update

NOVEMBER 1994

Digital's IT solutions take you beyond the mainframe

The energy of your business —

ultimately expressed in products and services — is shaped and

channeled by the force of your information technology (IT). But old

ways of doing business and the technology systems that support

them often restrict your energy, making your organization inflexible

and slow-moving.

Around the globe, businesses looking to maximize competitiveness are relying less on constraining mainframes and depending more on solutions that:

- Strengthen competitive advantage
- Decrease cost
- Increase functionality
- Empower organizations
- Leverage legacy investments

Digital delivers proven, investment-protecting, leadership IT solutions that meet these goals. These encompass hardware, software, and services "beyond the mainframe" that can change your competitive stance as you move into the 21st century. As your mainframe downsizing technology partner, we bring unique skills and capabilities to the job of unleashing the power of your information systems.

The industry's most powerful platforms

Digital's Alpha AXP and VAX platforms deliver superior functionality and flexibility for a fraction of the cost of a traditional mainframe — and include support for your business-critical applications.

Proven experience

Digital offers you wide-ranging, proven experience as a mainframe downsizing partner with comprehensive, leadership solutions and a resource pool that includes best-in-class application providers, tools, worldwide systems integration, service, and support capabilities.

Multivendor capabilities

We provide support for multiple computing styles — including multivendor, open client/server, distributed and centralized processing — to best enable workgroups to collaborate and improve business processes.

Integration solutions

Our multivendor data and applications integration solutions enable you to transparently access and integrate multivendor data — regardless of

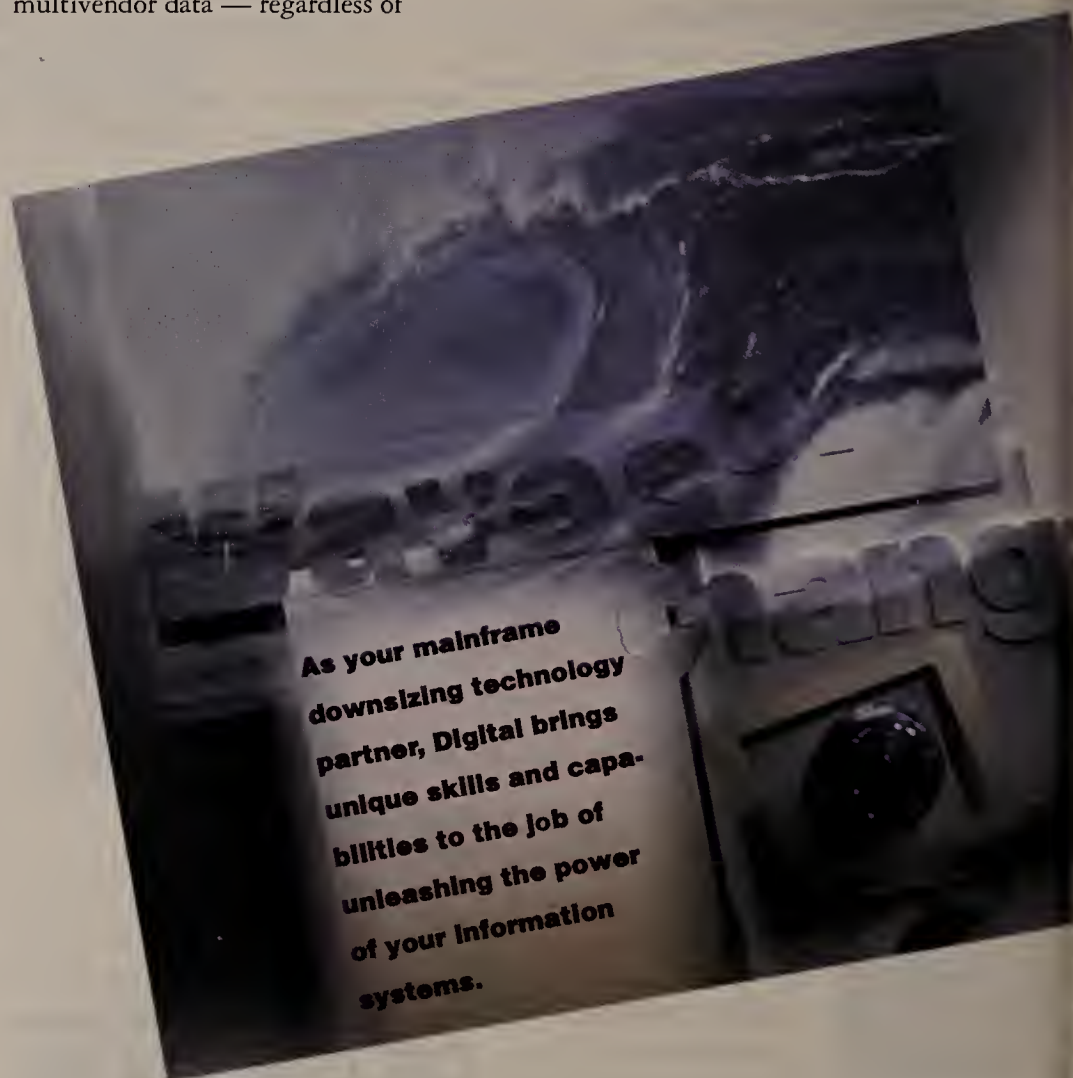
data location — to provide the right people with the right information in the right form at the right time.

Open technology plus complete support

Leadership open technology, including standards-based products; an unequaled ability to integrate multivendor components; and support for a wide range of computing platforms, operating systems, databases, applications, and network protocols make Digital your best partner in providing solutions beyond the mainframe.

For information on Digital solutions
that extend "beyond the mainframe,"

CALL 1-800 DIGITAL
(1-800-344-4825) and reference JFT.



ALPHATM
GENERATION

The following are trademarks of Digital Equipment Corporation: AlphaBridge, Alpha AXP, the AlphaGeneration design, AXP, DEC DECUS, Digital, the DIGITAL logo, LinkWorks, OpenVMS, PATHWORKS, POLYCENTER, StorageWorks, and VAX. MS and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. OSF/1 is a registered trademark of the Open Software Foundation, Inc. ORACLE is a registered trademark of Oracle Corporation. cc-Mail is a registered trademark of cc-Mail, Inc. IBM is a registered trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc. List prices are U.S. Manufacturers' List Prices and are subject to change.

Computer Careers

High-tech

By
Erin
Callaway

HUNT

ATTENTION JOB SEEKERS!

THINK YOU KNOW ALL THE TRICKS TO FINDING A JOB? Well here's one you ought to learn fast if you haven't already: Get on-line. While it's always a good idea to keep an eye on the newspaper classifieds, many of today's career consultants will tell you you're missing the boat if you don't take advantage of the number of on-line job services.

Having hunted around in cyberspace for several days to see just what's available, I can vouch for the fact that it's a very large and growing boat indeed.

You'll find everything out there from databases of nationwide job offerings on bulletin boards like JOBS BBS to "live," on-

line job counseling on the America Online Career Center to job-searching discussion forums on Internet Usenet news groups. These services are hot, bringing opportunities and contacts you'd never even hear about via conventional job-searching methods right to your desktop, usually at little or no cost.

This list represents hours of net-surfing and modem-hopping. What's useful about the services here is they offer all kinds of jobs in information systems and computer-related fields. They're easy to use, too.

Yes, job searching has definitely changed. Instead of buying a pair of sensible walking shoes and pounding the pavement, it's time to rev up your modem and hit the airwaves.

COMPUTER CAREERS BBS

This bulletin board system (BBS) is sponsored by **Data Processing and Search Placement**, a recruitment office in Charlotte, N.C. For PC connection, dial **(704) 554-1102** (you'll need a maximum of 14.4K bit/sec. to connect). This BBS is not intended for recent college graduates, but graduate students with two or more years' job experience will find a variety of job listings here. If you have experience with PCs, Unix, client/server, IBM mainframes, Cobol, CICS, DB2, IMS or AS/400 RPG, you'll be a particularly hot item. Call Pat Luttrell at **(704) 554-1101** to discuss your career goals.

ON-LINE SERVICES

America Online (AOL) Career Center

Call **(800) 827-6364** to order free AOL software. Select Ctrl K and type "careers." Will give you access to:

- **Help Wanted-USA.** Running for 16 months, this service posts 4,000+ jobs a week. Select "Job Listings" and then "Search Help Wanted-USA database." Search by job title, geographic area, skill set (such as "entry-level") or any combination thereof.

- **E-Span.** Posts 1,000+ jobs per week. Use the same search terms you would use above.

The career center also provides resume templates, a cover letter library, a career resource library, an employment agency database, employer contacts and a live chat career counseling service.

CAREER LINK WORLDWIDE

You can access this service by modeming to **(602) 973-2002** (you'll need a maximum 2.4K bit/sec. now, but the service is moving to 14.4K bit/sec. in the next few months). Once you connect, enter user #177 and type password "Link." There is no charge to sample the system, but you will pay **\$15 a month plus 40 cents a minute on-line time** if you want to subscribe. You can't upload your resume, but you will find 450 new worldwide jobs a week. This is a no-nonsense database where you can search by job type, career field and region.

ON-LINE CAREER CENTER (OCC)

On the Internet, telnet or gopher to occ.msen.com, or use <http://occ.com/> to connect via the World-Wide Web. Send E-mail to occ-info@msen.com and put the word "info" in the subject line for additional information on how to connect.

There are no charges to use the OCC. Not only will you find extensive job listings, but you can also post your resume and create cover letters on-line. More than 100 companies are members of OCC, including consulting companies and major corporations. About 3,000 companies have used OCC to find recruits, according to Bill Warren, executive director.

Alex James, a systems analyst at Howard Systems International, Inc., an information management consulting firm in New York, used OCC and found himself with four job offers in one week. "I found OCC to be very resourceful and user-friendly and extremely valuable for people looking for work in a computer-related field," James says. "You get a much better feel from the postings about what a job is really about — from salary, the employer's expectation, job duties, down to the last small detail."

James says the only drawback with the service is that it tends to list highly techie jobs. "You don't find a lot of management systems" type positions included, he says.

Hunt, page 117

Opportunities Nationwide

We are seeking:

- Project Mgrs, Team Leaders
- Database Specialists
- Programmer Analysts
- Network Managers
- Technical Specialists

Skills in these areas:

- LAN, WAN, TCP/IP, X.25
- SMALLTALK, C++
- VISUALBASIC, GUI, MOTIF
- WINDOWS, UNIX, OS/2
- DB2, CICS, IMS, IDMS, ADABAS
- COBOL, C, NATURAL, FOCUS, SAS
- POWERBUILDER, SYBASE
- ORACLE, INFORMIX
- SAP, PEOPLESOFT, LOTUS NOTES

WALTER & ASSOCIATES
P.O. Box 3358
Olathe, KS 66063-3358
FAX 913-764-9381

CONSULTING & FULL TIME POSITIONS

DICE is a FREE online job search service, providing detailed information about current contract and full-time positions across the USA. Use your computer and modem to access the latest job openings. It's a confidential, easy to use, no cost way to search for a new job.

D ATA PROCESSING
I NDEPENDENT
C ONSULTANT'S
E XCHANGE

ONLINE Number:
515-280-3423

Contact DICE via 1200/14400
baud Modem 8-N-1
A service of D&L Online, Inc.
515-280-1144

COMPUTERPEOPLE

Developing Careers In Developing Technologies

Join Florida's Leader In Consulting, Training and Permanent Placement.

CLIENT/SERVER ENVIRONMENTS

- C • C++ • SmallTalk • Visual Basic
- PowerBuilder • Oracle • Informix • Sybase
- Windows NT, MFC/SDK, MS Access
- Unix • Lotus Notes

IBM MAINFRAME

- DB2/CICS • IMS DB/DC • Cobol

IBM MIDRANGE

- AS400 Programmers

APPLICATION PACKAGE SOFTWARE

- Arthur Andersen DCS, MACPAC
- SAP MM, FIN • M&D Payroll, HR

OCCUPATIONS

- Object Oriented Analysis & Design & Implementation Experts
- Internal Position in Orlando for Business Development
- Sr. Programmer/Analysts
- Business Analysis

Microsoft
SOLUTION PROVIDER



Tampa Bay Area
12225 28th Street North
St. Petersburg, FL 33716
800-554-7206 • FAX 813-572-6088

Ft. Lauderdale Area
3265 Meridian Pkwy, Suite 122
Ft. Lauderdale, FL 33331
800-777-8603 • FAX 305-389-0204

Orlando Area
201 E. Pine St., Suite 1305
Orlando, FL 32801
800-299-9953 • FAX 407-843-8153

Jacksonville Area
Freedom Commerce Centre
8375 Dixie Trail, Suite 403
Jacksonville, FL 32256
800-246-4085 • FAX 904-464-0290

Candle

World Leader in Object Systems Management.

Exciting Challenges For Visionaries

Candle Corporation is the world's leading independent supplier of system management software. It's a whole new world for power players with 8+ years industry experience to join our team. Positions are available in Washington, DC, Santa Monica, CA, and Oakbrook, IL.

SYSTEMS ENGINEER

Requires BA/BS in CS (or related) or equivalent experience; 3+ years UNIX experience; solid working knowledge of UNIX System Administration, Networking protocols (TCP/IP, SNA, LU6.2, NETVIEW/6000, HP/OPENVIEW, etc.); strong technical leadership and Problem Management skills; good understanding of MVS, OS/2, Motif and Windows NT environments, mainframes.

ACCOUNT MANAGER

Requires BA/BS in CS or Marketing (or related) or equivalent experience; 3+ years in C/S, Open systems or UNIX software sales; working knowledge of distributed systems (C/S) industry issues, competitors and trends; understanding of MVS, OS/2, Motif, Windows NT, mainframes; proven abilities to work as team player, consistently exceed sales quotas, accurately forecast over 90-day period, develop viable financial alternatives, successfully negotiate with accounts and perform account and territory management.

BUSINESS UNIT MANAGER

Requires BA/BS in CS or Marketing (or related) or equivalent experience; 3+ years software sales management experience; working knowledge of distributed systems (C/S) industry issues, competitors and trends; proven abilities to work as team player and leader, hire/develop highly successful sales people, consistently exceed sales quotas, accurately forecast over 90-day period, develop viable financial alternatives and contracts, successfully negotiate with accounts and to manage employees in remote locations.

All positions involve travel up to 60% of the time and also require the ability to work independently as well as very good communication and presentation skills.

For consideration, please forward your resume with salary history to: **Candle Corp., 2425 Olympic Blvd., Attn: HRSD, Santa Monica, CA 90404.** EOE.

CONSULTANTS SHOULD CONSULT

MIMI

IMMEDIATE CONTRACTS

Please send resume & call
Mimi Simon Assoc.
90 West St., Suite 1105, NYC 10006
(212) 406-1705
FAX (212) 406-1768

★ GET OUT OF TOWN NATIONWIDE OPPORTUNITIES

YOUR HOME TOWN MAY HAVE MANY JOBS, BUT NOT YOUR CAREER OPPORTUNITY. THE NATIONAL COMPUTER SEARCH AGENCIES SPECIALIZES IN THE NO CHARGE PLACEMENT AND EMPLOYER PAID RELOCATION OF COMPUTER PERSONNEL TO ALL AREAS OF THE U.S.A. & OVERSEAS.
TOLL FREE 1-800-752-3674
FAX (216) 356-9991

COMPUTER TECH NETWORK

21010 Center Ridge Rd.
Rocky River, Ohio 44116

Inc. 500
1994
1993
1992

To Advance Your Career, Join Our Winning IT Consulting Firm.

The Registry, Inc., a leading IT consulting firm, is one of a select few organizations to be honored as a three-time Inc. 500 company. We appreciate that our rapid growth and success is attributable to the success of our best-in-class consultants. That's why we offer our consultants unparalleled opportunities, through our:

- **Technology Sector Recruiting**
Enables our specialized recruiters to fully understand consultant skills and capabilities.
- **Delivery Management System**
Matches consultant expertise and professional goals with the best local and nationwide opportunities.
- **Flexible Career Options**
Provides hourly and salaried positions both short- and long-term.
- **Consultant Retention Program**
Builds long-term relationships through successive project placements.



The Registry, Inc.

Attn: National Division, 189 Wells Avenue, Suite C, Newton, MA 02159

Atlanta, GA	Columbus, OH	Greensboro, NC	Richmond, VA
Boston, MA	Dallas, TX	McLean, VA	Rosemont, IL
Charlotte, NC	Denver, CO	Newton, MA	San Francisco, CA
Chicago, IL	Durham, NC (RTP)	New York, NY	Seattle, WA
Cleveland, OH	Ft. Lauderdale, FL	Rye Brook, NY	Schaumburg, IL

For the leading edge opportunities below, contact
Mike Forbes (mforbes@tri.com):

Mainframe Developers DB2 CICS Cobol

Boston, Chicago, Cleveland, Denver, Durham, Ft. Lauderdale, Greensboro, New York City, Richmond, Rye Brook

Visual C++ or Visual Basic, MS-Windows

Atlanta, Boston, Charlotte, Chicago, Dallas, Greensboro, RTP, Seattle, Washington, DC

OS/2 PM C/C++

Atlanta, Cleveland, Dallas, Denver, Ft. Lauderdale, New York City, Rye Brook, Seattle

UNIX, TCP/IP, C/C++

Atlanta, Boston, Charlotte, Chicago, Dallas, Denver, Durham (RTP), Ft. Lauderdale, Greensboro

For the hot opportunities below, contact
John Byrne (jbyrne@tri.com):

Sybase or Oracle P/As and DBAs

Boston, Chicago, Dallas, Denver, Ft. Lauderdale, New York City, Rye Brook, San Francisco, Washington, DC

UNIX Sys. Admin. - all flavors

Boston, Dallas, Denver, New York, Washington, DC

In addition to excellent compensation, we provide a 401(k) plan and healthcare options. **Please e-mail, fax or call with your selected opportunity and location:**

1-800-248-9119 • Fax: 617-527-8805

Computerworld makes your positions known.

When you have positions to fill - and you want to tell the nation's top talent about them - Computerworld is your best choice.

That's because Computerworld places your message in front of over one half million qualified computer professionals every week. And you can choose to deliver your recruitment message regionally and nationally.

To place your advertisement, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700), ext. 201.



RIYAD BANK Saudi Arabia

Riyad Bank is one of Saudi Arabia's most prominent financial institutions, with a substantial branch network across the Kingdom and international representation through offices in the USA and the UK. A continuing investment in implementing a state-of-the-art processing platform has allowed the Bank to expand its business strategies in order to focus on rapid changes within the domestic and international marketplace. Applications are invited for the following key positions, based at Head Office in Riyadh.

TECHNICAL SPECIALIST-DBS GENERAL LEDGER: MILLENNIUM (GL:M)

Reporting directly to the System Manager GL, the incumbent will be a member of a technical team installing the Millennium 2.0 platform, GL 3.00.04 as well as 11 other products. The individual will be the technical expert on GL:M and its interfaces. Previous experience of DBS GL is essential.

PROGRAMMER ANALYST-DBS GENERAL LEDGER: MILLENNIUM (GL:M)

As part of the technical implementation team, the incumbent will be responsible for developing enhancements to the GL system and be capable of developing complex COBOL and PDL programs. Specific responsibilities will include applying COBOL changes for batch and online programs, coding in JCL/PROCS and familiarity with all GL:M screens. Previous experience of DBS GL, COBOL and mainframe is essential.

Riyad Bank offers a highly competitive compensation package which includes a tax free salary (at source), paid housing in a western style compound with superb sports facilities, transportation allowance, medical cover, annual airticket home (married or single-status) over 35 days holiday per year and an end of service bonus. Riyadh is conveniently situated for travel to Europe and the Far East and is a low cost of living environment with excellent educational facilities and a wide array of social activities. Qualified candidates should direct resumes immediately to: DTA, Box 1116, 466 Lexington Avenue, 4th Fl., New York, NY 10017, or fax to the Recruitment Department, Riyad Bank: 011-966-1-404-1738 (before 12pm EST).

Software Engineer, respnsbl. for dvlpmt., evaltn., & maintnc. of Intel's real-time oper. sys. (iRMX); enhnc & maintn. TCP/IP netwrk. subsys.; ensur. swr. supprt. for various LAN hrdwr. adptr. cards by invstgng. & fixing bugs in swr. & imprvng. perfmrnc. of netwrk. layer in oper. sys.; trn. custmr. supprt. engnr. & fld. persnnl. in custmr. supprt. issues. Req: M.S. Comp. Scnce. or equiv. crswrk.; wrk. exp., grad. rsrch. or crse. wrk. must have provided: hands-on bckgrd in devlpng. swr. applctns. for real-time multitaskg. oper. sys.; knwldg. of comp. netwrk. protocols (TCP/IP & OSI) oper. sys. dsgrn.; ably. to progrm. in hi lvl. lang. like "C" & 1 assmbly lang.; ably. to analyz. problms. & dbg.; understndg. of comp. arch.; knwldg. of intrnls. of UNIX-like oper. sys. & devlpmt. envrns. Min 40/wk; \$3,830/mo; job location: Hillsboro, OR. Attn. job order #5550820. Qual applnts. send res. to: Oregon State Employment Division, 875 Union Street, N.E., Room 201, Salem, Oregon 97311. Pr. of auth. to wrk. in US req. if hired. The company is an Equal Opportunity employer and fully supports affirmative action practices.

SOFTWARE ENGINEER required. Object oriented design, analysis & implementation of software systems on UNIX & DOS platforms using Smalltalk & C++. Development of Open Control Interfaces using object oriented paradigm for simulation & control. Simulation modeling & analysis using SIMAN, CINEMA & SLAMII with programming in C, Fortran & Basic. Modeling of processes for concurrent engineering project management using expertise in computer integrated manufacturing. Utilize optimization & scheduling algorithms & operations research skills of linear, non-linear & combinatorial programming. Masters Degree or its Equivalent required in Math, Computers or Engineering plus 1 year experience in the job duties described above. University level project experience may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary-\$60,000/year for a 40 hour work week. Hours 8-5. Send resume (must include social security number) to Job Service, 700 Wade Avenue, P.O. Box 27227, Raleigh, NC 27611. Refer to J.O. Number NC7243558, DOT code 030.062-010.

COMPUTERWORLD

Microsoft takes the IBM pumps client/server

**Weekly. Regional. National.
And it works.**

KASTA, JAMES & ASSOCIATES BBS

This BBS in Edina, Minn., provides job listings for IS and engineering positions in the Twin Cities metro area. There is no fee. Dial **(612) 536-0533** to connect (maximum 14.5K bit/sec.).

**CAREER CONNECTIONS, ON-LINE INTERACTIVE
EMPLOYMENT NETWORK HUMAN RESOURCES
ELECTRONIC ADVERTISING AND RECRUITING
TOOL (HEART)**

Telnet using the Internet to career.com or college.career.com or modem to **(415) 903-5815**. When you register, which is free, you will be told how to create your resume on-line. There is a list of jobs, and when you want to apply, you can use a command to send your resume to that employer automatically. You can search for jobs by company, region, job title and skill set. You can also create cover letters on-line.

DP NETWORK

This database, run by Toner Corp. in San Francisco, lists data processing jobs for the San Francisco and Sacramento areas. Job listings are updated daily. You can upload your resume, get information on user groups and other organizations and register with employment brokers. Independent consultants can also search job contracts. There is no fee for any of these services. Dial **(415) 788-7101** (maximum 9.6K bit/sec.) or **(415) 788-8663** (maximum 2.4K bit/sec.) to connect.

CAREER SYSTEMS

This BBS lists a variety of jobs including data processing positions nationwide. There is no fee. Dial **(413) 592-9208** to connect. Note: When I dialed into this bulletin board, I was sent a message saying they are currently suffering from user overload. The systems operator apologizes for any difficulty you have connecting. There is, however, a dial-back feature that alerts you when an open line becomes available.

JOBS BBS

This bulletin board provides a source for jobs nationwide. It is sponsored by **Ken Zwaschka & Associates**. By phone, call **(503) 287-2990**. By modem, dial **(503) 281-6808** (you'll need a maximum of 9.6K bit/sec. to connect). There is no fee.

There are many other listings with lots of computer/information systems jobs as well as discussion areas for job searching topics.

INTERNET NEWSGROUPS

misc.jobs.misc	Discussions about job hunting. Do not post resumes or jobs here.
misc.jobs.offered.entry	Entry-level positions available.
misc.jobs.resumes	Post your resume here. Please post in ASCII format only.
us.jobs.resumes	Post your resume for U.S. positions.
us.jobs.offered	Job offerings in the U.S.
us.jobs.offered.entry	Entry-level positions available in the U.S.
ba.jobs.offered	Positions offered in San Francisco area.
balt.jobs	Baltimore/Washington area jobs.
dc.jobs	Washington and surrounding area jobs.

Compiled by: Margaret F. Riley, Circulation librarian, Worcester Polytechnic Institute, Worcester, Mass.

COMPUSERVE CLASSIFIEDS

Call **(800) 848-8199** to obtain membership and your local access number. There is a **\$39.95** charge for CompuServe access software, or you can use any basic communications package. You pay **\$8.95** a month for unlimited access to 70 basic services, including the Classified section, which includes a database of jobs and a resume service.

BOOKS TO CHECK OUT

The Electronic Job Search Revolution and The Electronic Resume Revolution by Joyce Lain Kennedy and Thomas J. Morrow (John Wiley and Sons, **800-CALL-WILEY**). Available in paperback, **\$12.95** each.

Callaway is *Computerworld's* assistant researcher, Resource Center.

CONSULTANTS
Immediate Interviews

MAINFRAME
DB2/CICS • EDI • ADSO
DB2 or CICS • IDMS • IMS
Natural 2 • Internals • VM
Tandem • Ramis • AS 400
ADW or IEF • CSP • HPS
VTAM • APS • PL1
AS400 Lansa • CASE • BAL

CLIENT SERVER
Lotus Notes • VAX/RDB • Excel
Powerbuilder • Informix • Banyan
Market Data • Novell • Paradox
SAP/R-3 • Oracle • Unix
Lan/Wan • Sybase • Smalltalk
Visual C++ • Access • C++
Sys/Admins • TCP/IP • Motif
Windows • Testing • MF/Cobol
Windows NT • Vis Basic • OLE 2.0

Rohn Rogers Consulting
1212 6th Ave, 9th Fl, NYC 10036
800-421-5158 212-921-1319
Fax 212-302-4363

**ORACLE
FINANCIAL
CONSULTANTS**

Good Consultants
Required
○
Excellent Rates
○
Immediate
Assignments

Dataforce Inc.
Tel: 305-471-0811
Fax: 305-471-9054

WANTED
AS/400 DEVELOPERS
CHICAGO

We are looking for developers with at least 2 years of development using RPG on the AS/400.

If you want to work in an environment that will allow you to increase your technical skills and have the ability to develop CASE technology, then this is for you. Send your resume to: Swdevelop@aol.com or Fax 708-932-7753 (with cover sheet)

If you just want to be one of the crowd don't bother sending your resume

WE WANT ONLY THE BEST!!!

Join us as we reengineer our business processes and our I.T. organization utilizing AS/400 and Client/Server technologies.

Business Consultants

Coordinate I/T support for reengineering teams. Must understand marketing, order fulfillment or cost management. Able to manage concurrent projects. Experience reengineering mission critical processes.

EDI Positions

Entry level to Senior Analyst. Experience with GENTRAN or any other EDI translators preferred. Experience with any transaction sets considered.

Supervisors, Systems Integration

Direct, coach and manage. Must be process improvement oriented and willing to "dig in" as well as to manage.

Process Specialists

Requires business analysis/design orientation, visionary skills. Work closely with Business Consultants and users. May direct others.

Process Analysts

Requires business and technical skills, programming and/or design of AS/400 and/or Client/Server (PowerBuilder).

Shipping or transportation industry experience preferred. All positions require people who are team players, good communicators and customer oriented.

Send Resumes to: Lykes Bros. Steamship Co., Inc., 300 Poydras Street, New Orleans, LA 70130 AA/EOE A Drug-Free Workplace M/F/D

POWERBUILDER

Immediate openings in Jacksonville, FL for PowerBuilder developers. Jacksonville is the number 1 city in Florida for computer software growth, and **IMA PLUS** is the only Inc. 500 software development firm headquartered in Jacksonville, FL. For immediate consideration, call or fax your resume to Larry Williams:

IMA PLUS
9428 Baymeadows Road, Suite 500
Jacksonville, FL 32256
1-800-462-1886
(904) 737-0666 (FAX)



"Enterprise Computer Solutions"

IMMED. OPENINGS

DATA ARCHITECTS & MODELERS: SW Ohio RelatI database exp i.e. Oracle, Informix, Sybase DOD exp a * \$40-\$70K.
C++ P/A: Object-oriented design software developers for Lexington KY. Must have 2+ yrs C++ in Windows environment. exp with NLMs a plus \$45-\$60K.
DEC VAX P/A: Cinti OH 3+ yrs Cobol in DEC VAX/VMS environ 4 yr degree \$40-\$55K.
AS/400 P/A: SW Missouri Strong AS/400 & RPG III manual and/or financial sys 2+ yrs exp \$35-\$45K.

TASK GROUP
P.O. Box 15757, Cinti, OH 45215
(513) 772-7752

IEF Exciting Projects

✓ Winter in CA
✓ Ski the Rockies
✓ "Big-6" consulting (SE)
✓ 5.3/GUI (Midwest)
Also, experts in JAD, BPR, OO/C++, 4GLs, CASE, RDBMS, SGML

FAX resume to: 214/733 4430
FUSION InfoTech, Inc.
18352 Dallas Pkwy
MS-136-220,
Dallas, TX 75287
1-(800)-230-FUSN

DATA PROCESSING

Contract & Permanent Jobs:

• COBOL / CICS
• DB2 & IMS DB/DC
• UNIX SYS ADMIN
• C / C++
• NOVELL ADMIN
• FOCUS / VISUAL BASIC
• SQL SERVER / ACCESS
• INFORMIX / ORACLE
• IDMS / TELON
• INGRES / IDEAL

Fax or send your resume to:
PROTECH SYSTEMS GROUP, INC.
5545 Murray Road, Suite 300
Memphis, TN 38119
901-767-7550
Fax: 901-767-9350

Carolinas/Southeast

POWERBUILDER P/A
LAN/WAN TECHNICIAN
CICS/COBOL/DB2 P/A
UNIX/C++ • ORACLE P/A
ORACLE P/A S DBA'S
SYBASE P/A S DBA'S
TELON/IMS P/A S
ORACLE/SOLNOVELLUC •
AS/400 S/P S P/A S

All expenses paid by client companies on these permanent and nationwide opportunities

Contact:
Don Mullis
(704) 366-1800
CORPORATE
STAFFING
CS
P.O. Box 221739
Charlotte, NC 28222-1739
(704) 366-0070 (Fax)

Pacific Northwest

PDG
Pacific Data Group

We have a proven track record of systems integration and information services consulting. Our 7 years of double digit growth and market leadership is due to our strong ethics, skilled employees and ability to offer top pay.

PDG offers an attractive compensation and benefits package. For immediate consideration, mail, fax or e-mail your resume to: Pacific Data Group, Inc., 10300 SW Greenburg Road, Suite 230, Dept C, Portland, OR 97233. Fax: (503) 293-3898. Tel: 503-293-2499.

Internet: 70540.314@compuserve.com.
Equal opportunity employer.

◆ DB2, CICS
◆ IMS DB/DC
◆ IDMS/DC
◆ ADS/O
◆ COBOL, CSP
◆ Huron
◆ C/C++
◆ PowerBuilder
◆ Oracle V6/V7
◆ Oracle Forms
◆ Oracle Case
◆ Windows NT
◆ Visual Basic
◆ SQL Server
◆ SQL Windows
◆ PL/SQL
◆ RAD/JAD
◆ IEF, ADW
◆ Excelerator II

Computer Careers East

Several of our top clients located in North Carolina have outstanding opportunities for talented prof's w/ excellent technical expertise.

AS/400 SPECIALISTS

- MIS Mgr: Mfg exp, LAN/WAN Installation & RPG
- Project Mgr: Flt'l application exp.
- S/A: Mfg, RPG, & BPCS
- P/A: JD Edward, MAC PAC, Software 2000 &/or Data 3

Our clients offer salary commensurate w/exp. Send resume or call:

FORTUNE Personnel Consultants

Attn: Louise Trudeau
P.O. Box 98388
Raleigh, NC 27624-8388
PH: (919) 848-9929
FAX: (919) 848-1062

SOUTHEAST Permanent & Contract

- AS/400
- P/A AS/400 Software 2000
 - P/A MARCAM, MACPAC, JOMAR
 - AS/400 User Support

Mainframe

- P/A M&D, MSA, OBS
- P/A DB2, CICS, COBOL

PC

- P/A & OBA Oracle or Sybase
- P/A MS Access or Visual Basic
- P/A 'C', C++ (UNIX or DOS)

ProSelect

P.O. Box 72613
Marietta, GA 30007
404-973-2566 fax 578-9586

This
Space
for
HIRE!
CALL:

800-343-6474

in MA.,
508-879-0700,
ask for
John Corrigan,
Vice President
Classified
Advertising.

COMPUTERWORLD

Weekly.
Regional.
National.

And it Works!

WANTED: IS Professionals with Enterprise Perspectives!

DATABASE DESIGN SOLUTIONS, the corporate database revitalization experts, is expanding! We have an immediate need for:

- Repository Specialists
- C/S Software Developers (C++)
- Data Modelers (E-R and O-O)
- DBA's - DB2, DB2/2, Sybase
- VP of Marketing

Flexible employment options. Send resume w/ reimbursement req'ts to:

Adrienne Tannenbaum
Database Design Solutions
PO Box 19, Pottersville, NJ 07979-0019
Fax: 908-439-2640

No phone calls please!

DATABASE DESIGN SOLUTIONS

Corporate Database Revitalization

DP RECRUITERS

Brannon & Tully, Inc., the Southeast's most progressive computer consulting firm with over 200 employees is hiring several Senior Technical Recruiters due to unprecedented growth. Base salary, bonus and commission as well as a comprehensive benefit package including 401(k), medical, dental and life are offered. We are hiring for Atlanta, GA, Washington DC, and Birmingham, AL offices. Only experienced Technical Recruiters reply please.

BRANNON & TULLY

Cheryl Smith
3690 Holcomb Bridge Road
Norcross, GA 30092
Phone: (404) 447-8773
FAX: (404) 729-9803
OR
Katie Sleep
12030 Sunrise Valley Drive
Suite 300
Reston, VA 22091
Phone: (703) 391-6270
FAX: (703) 391-6267

COMPUTER \$OPEN + BENEFITS

SR. UNIX NETWORK ADMIN

Large Queens-based builder seeks Sr. Unix Network Admin with 5 yr min exp in Multi-Server and TCP/IP networks. Oracle DBA exp helpful. Salary commensurate with bgnd. Send reume to: L/T/C, 5th Fl., 71 5th Ave., NYC 10003.

DP STAFFING SINCE 1969 PERMANENT FL. OPPTY'S

OOA/OOD CORBA DCE \$75K
Network Mgr Frame Relay \$70K
QA Unix C PowerBuilder \$45K
DBA's Sybase / Informix \$65K
P/A's PowerBuilder C++ \$55K
Sr. P/A Sybase C++ \$55K
Sys Prog DB2 & IMS \$50K
P/A's Unix C++ Informix \$55K
Proj Mgrs Unix C C++ \$65K
LAN Analyst MS MAIL \$48K

AVAILABILITY, INC. Dept C.
P.O. Box 25434
Tampa, FL 33622
813/286-8800, Fax 286-0574

D.P RECRUITER D.P. SALES

Fast paced established consulting co. needs aggressive D.P. Professionals. Must have good recruiting/sales skills. Positions could lead to V.P. position w/office in NYC. Excellent compensation.

Call Walter Sheridan
S16-222-0000

LEHIGH GIT
900 Ellison Ave.
Westbury, NY 11590

Senior Systems Analyst/ Programmer

Will be involved in the developing and running of spatial models on Transputers and Connection Machine, and implementing standard Image Processing functions. Will work on a variety of advanced programming assignments in high-level languages such as C, C++ and FORTRAN including working on the Everglades landscape model and natural system model. 40 hour week, 8AM - 5 PM, \$42,000 per year.

Bachelor of Science or equivalent in Computer Science or related field and 2 years experience in job offered or 2 years as research assistant or assistant manager software. Submit resume to: Job Service of Florida, 2660 W. Oakland Park Blvd., Ft. Lauderdale, FL 33311-1347. Re: Job Order Number FL-1139105.

SECURITIES RESEARCH

ANALYST - Reverse engineering of complex Collateralized Mortgage Obligation (CMO) deal structures to model cash flow characteristics of CMO bonds purchased; pricing of securities & interest rate derivatives for proprietary portfolio monitoring system; analyzing total return characteristics of specific securities considered by portfolio managers for use in portfolios; developing & maintaining internal monitoring systems for proprietary portfolio strategy; employing internal systems developed to provide continuous updating of position valuation & risk parameters; supporting manager in portfolio optimization process using our proprietary portfolio management system; testing & validation of in-house software development. MBA required. Salary is \$28,600 per year, M-F, 8:00 a.m. to 5:00 p.m. This job is located in Orlando, Florida. Forward resumes to Job Service of Florida, 3421 Lawton Road, Suite 100, Orlando, Florida 32803-2999. Reference # FL1137067.

IS Professionals

Are you looking to join a quality information Technology firm? If so, contact:

Software Data Services, Inc.
4600 Park Road, Suite 300
Charlotte, NC 28209
(800) 521-8077
FAX (704) 521-8078

- APS, DB2
- CICS, DB2
- IMS DB/DC
- CSP, DB2
- C++, UNIX
- EDI, Gentran
- MSA, H/R
- ORACLE
- PeopleSoft
- PowerBuilder
- Scanner/BarCode
- Sybase
- Visual Basic

Member NACCB / EOE

SDS

INTEK Technologies, Inc. is a premier Information Technology Services firm. We offer software professionals exciting and challenging opportunities implementing solutions and delivering results for our clients. Three basic principles have established INTEK as the resource provider of choice: Deliver World Class Results; Delight the Client; Maintain High Employee Satisfaction. Permanent and contract consulting positions available nationwide. Permanent employees receive competitive salaries, health benefits, bonus opportunities and profit sharing. If you have 3+ years practical experience in:

INTEK
TECHNOLOGIES
An Equal Opportunity Employer.

3390 Peachtree Rd., NE
Suite 1000, Atlanta, Georgia 30326.
Fax: (404) 239-1723 • Tel: (404) 239-1725

PowerBuilder
ADW
OLE2
IEF
Visual Basic
MFC
DBMS
DB2, CICS
ObjectView
IMS
Sybase
Oracle
MicroFocus COBOL
SmallTalk
OS/2 PM
C/C++
ForeSight
Navigator

Send or fax
your
resume to our
corporate
offices at:

Western New York - IS Opportunities

UCA is one of the fastest growing companies in America. We are an outsourcing provider of direct marketing and tech support services to the top PC software and technology companies. Our environment is all client server, based on Informix, Hewlett Packard, and HP-UX. We have a wide variety of positions for world class, high growth, professionals who want a challenge.

WAN Manager: Build a Wide Area Network based on Sprint's Frame Relay technology. 5-7 years of progressive WAN experience, good customer relations skills.

Internet: Design and build a World Wide Web service business that would move our clients to the Information Highway for both marketing and sales applications.

Database Programmer/Analysts: Informix/UNIX or comparable database experience required. 2-5 years of experience, ability to work directly with customers to design, develop and maintain solutions. Accounting, distribution, manufacturing or direct marketing applications experience a plus.

Front End Developers: Powerbuilder, Visual Basic, C++ experience in developing business applications. Ability to think forward in terms of interface and design. Rapid Development experience a plus.

Tech Support: All experience levels and expertise needed. Be the "expert's expert". Position available from mechanical, networking, applications, consumer software, client server software.

Due to our continued growth, positions will exist in other areas. If you are looking for a company that is fast moving, energetic, and will give you the opportunity to grow, this is the one. Please FAX or mail your resume and cover letter to: **UPGRADE CORPORATION OF AMERICA, Suite 390 - Human Resources - North, 699 Hertel Avenue, Buffalo, New York 14207, FAX: (716) 871-6459**

PROJECT LEADER LOAN ORIGINATIONS

Access Financial Corp., a nationwide lender specializing in manufactured housing loan origination and servicing, is continuing the growth of our Atlanta Headquarters. Reporting to the Manager of Systems and Computer Resources, this position requires qualified applicants to have DOS/Windows development experience, team leadership with supervision of at least 2 Programmer/Analysts, and mortgage and/or banking application experience. Candidate should have project management and PC programming experience.

Successful candidate will be motivated, results-oriented, capable of working independently, and able to work in a fast-paced environment. Candidate must possess strong interpersonal and communications skills as well as promoting team development.

The selected individual will be offered an excellent salary and benefits package. Interested candidates who want to be a part of a progressive, growing company, should direct resumes (including salary requirements) to: Access Financial Corp., 1100 Abernathy Road, Suite 1200, Bldg. 500, Atlanta, GA 30328. Attn: H.R. NO PHONE CALLS PLEASE. EOE M/F/D/V.

Software Consultants

Neumenon, Inc., a high tech computer software and services company, is seeking to fill immediate openings with the following qualifications to fill positions in both our Plymouth, MI and Durham, NC facilities. Software Consultants with 3-6 years experience in application development using data modeling, tools-based construction and structured techniques.

- SYNON
- Obsydian
- AS/400
- UNIX

Some travel will be required.

Applicants for both locations should send/fax resumes for immediate consideration to: Neumenon, Inc., 1000 Park Forty Plaza, Suite 520, Durham, NC 27713, Fax (919) 544-6590, Attn: Human Resources. Neumenon is an equal opportunity employer providing excellent career development, full benefits and an exciting future.

Neumenon

Build Your Career With Us!

Advanced Technology Systems currently has permanent positions available in Charlotte, NC. Qualified individuals will possess at least 1-1 1/2 years of experience with any of the following:

Languages:

- C
- SmallTalk
- Power Bullder
- Cobol
- Visual Basic

Operating Systems:

- MVS
- OS2
- UNIX

Databases:

- IMS DB/DC
- Oracle
- DB2

Other Skills:

- CICS
- JCL
- APS
- IEF
- Excellerator

ATS offers competitive salaries and excellent fringe benefits. For consideration, please forward resume to: **Advanced Technology Systems, Inc., Suite 2460, 301 S. Tryon Street, Charlotte, NC 28282; FAX (704) 376-7369.** An Equal Opportunity Employer.

ATS

Advanced Technology Systems, Inc.

PROGRAMMER ANALYSTS

At Humana, we rely on the skills and professionalism of our staff to continue a tradition of excellence.

As a result of recent acquisitions and our entry into new product lines, Humana's Information Systems departments are expanding their staff. We are currently seeking 20+ development professionals. Knowledge in development of client server applications and relational data base tools is desirable. Experience in one or more of the following would also be a plus: Microfocus, COBOL II, LAN, DB2, FOCUS, Sybase, DOS, OS/2, AIX, C++, SQL, EDI, CICS, IDMS, and VSAM. Strong project leadership skills are also desired.

This is a superb opportunity for motivated systems professionals to join a leader in the health insurance industry. We offer a generous benefits package and competitive compensation. For prompt consideration, send your resume with salary history to: Sherri Harbsmeier, Humana, Inc., Human Resources Department, 500 W. Main Street, Louisville, KY 40202.

Equal Opportunity Employer

Humana

Computer Systems Hardware Technician: Temporary full-time position 1/1/95-12/31/95. Modify computer systems hardware programs to be installed in clients' systems in Israel. Determine which hardware will best promote operational efficiency & facilitate long term usage. Translate instruction manuals & related software into Hebrew for Israeli clientele. Correspond with hardware manufacturers when assistance is needed. Search out & repair hardware problems prior to shipment of same to Israel. Meet with Israeli clients and/or correspond by telephone or facsimile to answer questions & give instructions regarding hardware set up & usage. Rqrmts: Must be available for full-time temporary employment 1/1/95-12/31/95; H.S. grad; 2 1/2 yrs. exp. in the job offered (as described); Must speak, read & write Hebrew; Must have legal authority to work permanently in the U.S. 40 hrs/wk., 9a.m.-5p.m. \$23,357/yr. All interested applicants shall contact, by 12/6/94, Jerry Druckman, President Int'l Tech. Dist., Inc. 2411 N.E. 196 St., N. Miami Beach, FL 33180 (305) 682-9618.

SOUTHEAST

Work and play in one of the most desirable areas:

beaches • mountains
lower cost of living
year-round golf • lakes

- Client Server
- Mainframe
- Networking

ACP

Salaried • Full Benefits • 401(k)
Referral \$

**American Computer
Professionals, Inc.**
140 Stoneridge Drive, Suite 350
Columbia, SC 29210
800-933-9227
Fax: (803) 779-1955
Internet: ACP@SCSN.NET
equal opportunity employer

Computer Careers East

Systems Analyst

Highly motivated individual with extensive experience in multi-platform distributed computing (distributed processing and databases, TCP/IP, WAN, WAIS, MOSAIC etc.) and object-oriented methodologies is needed to analyze user and system requirements and develop inputs for functional and technical specifications for a national network of information systems. Support the project engineer with development, implementation and testing of a prototype. Excellent oral and written skills required. Bachelor's degree in information systems required. Washington, D.C. Area. Send resume with salary requirements to: Personnel Dept., Rm 6, 13th Fl., 11 W. 42nd St., N.Y., N.Y. 10036 EOE/M/F

Programmer/Analyst: Develop, build, maintain, & trouble-shoot multimedia turn-key integrated educational networks w/ VELAN, Netware & Appleshare NOS; support, systematize, & debug a variety of educational software under ICLAS, VCLASS, & Menuworks environments; provide on-site technical services, train users & prepare operating & instructional manuals. Be able to use Multi-protocol (IPX/SPX, NetBios, TCP/IP, & AppleTalk) & integration & multimedia devices. Min. req.: M.S. in M.I.S. or C.S., w/ 1 yr. exp. in the above position or 1 yr. exp. in System integrating or related w/ ability to do all job duties stated above. Also require CNE (Certified Network Engineer) Certificate, \$32,500/yr. 40 hr/wk 8:30-5:30. Applicants send resumes to: Job Service of Florida, 2810 Sharer Rd., Suite 30B, Tallahassee, FL 32312, Re: Job order #FL-1138278.

Programmer/Analyst (RTP, NC) - Programming & systems development of COBOL & COBOL II financial & accounting applications software for proprietary batch & on-line deployment on IBM mainframe, under CICS and EASYTRIEVE PLUS, utilizing IMS database. Required: Bachelor's in computer science, computing or equivalent & 2 yrs. exp. in job offered. \$46,000/yr., 40 hrs/wk, M-F, 9-5. Apply to the nearest Job Service office or submit resume to: Job Service, 1105 S. Briggs Avenue, Durham, NC 27703. Job Order No. NC3041164 and DOT Code 030.162-014. Resumes must include applicant's Social Security number.

Finding a High Tech Job can be as easy as using your PC & Modem.

Dial In, and search through our data base of jobs throughout the USA. The same jobs are listed on all systems.

(404) 662-5500 - S.E. USA
(703) 379-0553 - Mid Atlantic
(813) 791-0101 - Florida
(8-1-N - to 19,200 baud)

We are a FREE service. You can also register your skills on-line, and our client companies will contact you.

The J-CONNECTION

Senior System Analyst....

...required for export division of major corporation. Duties are system design, program modification or generation, and general department responsibility in a small AS/400 & PC environment. Applicant needs four plus years experience with BPCS software, AS/400, RPG, LAN's and EDI based communications. Business or Computer Science degree also required. Spanish/English speaking and FoxPro usage are pluses. We offer a competitive salary, good benefits and a management that believes in team work. Resumes to: IAS, 9731 S.W. 154th Place, Miami, FL 33196.

Every week
Computerworld
delivers more
qualified
job candidates
than any
other
newspaper.

*That's
why
more
companies
place more
recruitment
advertising in
Computerworld
than in
any other
specialized
business
newspaper.*

COMPUTERWORLD

Microsoft takes the catch out of MATH IBM pumps client/server

To place your
advertisement,
call Lisa McGrath at
800-343-6474
in MA 508-879-0700
ext. 201

Weekly. Regional. National. And it works.

An IDG Communications Newspaper



**The
Monster
Board
Jobs
On The
Internet**

More than 500 people a day
view these Hot Jobs on our
interactive, easy to find
Web pages.

- * Software Engineers
- * Client/Server Developers
- * Networking
- * Programmer/Analysts
- * Product Marketing
- * Management

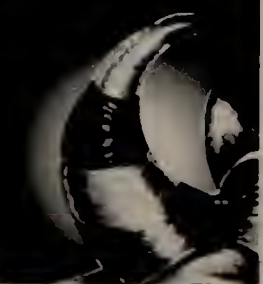
These jobs are just
a sampling of
opportunities on
the board.

Apply On-Line

Your Source For
**100's Of
Jobs**

Key in:
[http://www.
monster.com](http://www.monster.com)

To post jobs call:
(508) 655-6604



Sr. P/A for spearheading the identification of new computer technologies like OO methodologies (C++/Windows SDK) & techniques with potential value for company s/w applications; evaluation & recommending appropriate h/w & s/w products to create ideal IS for company applications; assisting in implementation of selected h/w & s/w products into the evolving company IS super structure; translating business & tech. req. into h/w & s/w specs; developing programming solutions in the area of multi-user Client/Server (UNIX based SQL server) LAN applications using tools.h++, commonbase, Drover's Toolbox & memory managers; designing codes, unit testing, preparing & executing test plans & other segments of computer programs; code maintenance using version control systems; controlling, debugging & documenting maintaining competency to work at the highest tech. level of all phases of applications systems analysis & programming. Req.: MSCS. Exp.: 2yr in the job offered or 2yr as Software Engineer. Exp. may be before, during or after degree. Must have used OO methodologies like C++/Windows SDK, developed DLLs for serial communications & GUI's. Used development tools like tools.h++, commonbase, Drover's Toolbox & memory managers; SQL servers & version control systems. QA procedures like unit testing, preparing & executing test plans. Worked under UNIX. 40hr/wk, 8am to 5pm, \$46,000/yr. Send resumes in duplicate (no calls) to G. Maugans JOB# 00791. Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216.

Consultant, 40hrs/wk., 9am - 5pm, \$45,000/year. Design & implement client/server systems using object-oriented technology & artificial intelligence; create multiprocessor Graphical User Interfaces (GUIs) using VisualWorks & XVT, including notebook widgets. Create relational schemas & administer Oracle systems. Administer a mixed network of UNIX, OS/2, Windows, & NetStep computers & maintain an Internet site. Create transparent layers merging relational & object-oriented systems. Systems programming & networking. Tools: Smalltalk-80; Digital/V; UNIX SYSV & BSD; ANSI-SQL; Oracle; C; C++; TCP/IP protocols; ErWin. Master's degree in Computer Science as well as six months experience as a Consultant or Research Assistant required. Prior experience must include: UNIX; C; GUI; SQL; Oracle; OS/2; networking. Graduate education must include: one course in object-oriented technology; one project each in creating a file system using network protocols & implementing backwards & forwards resolutions in Prolog & LISP. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Ruth Daniels, Reference #V-IL-12298-Y. NO CALLS. An Employer Paid Ad.

Computer

WE'RE LOOKING FOR STAR PERFORMERS IN INFORMATION TECHNOLOGY

New England, Birmingham, AL, and Fairfax, VA Opportunities

Join our team of Telecommunications Industry Specialists. We are looking for highly motivated self-starters to create state-of-the-art technology solutions for the dynamic business challenges facing the telecommunications industry. American Management Systems (AMS) Telecommunications Industry Group is a world class provider of customer information and billing solutions to the leading firms in this industry. We are experiencing rapid growth in our target market and are seeking key players to grow with us as we continue to expand.

We are currently seeking candidates for the following positions:

- PROJECT MANAGERS
- TEAM LEADERS
- BUSINESS/INDUSTRY CONSULTANTS
- DATABASE SPECIALISTS
- PROGRAMMER/ANALYSTS (all levels of experience)
- TECHNICAL SPECIALISTS
- QUALITY ASSURANCE SPECIALISTS
- TECHNICAL ARCHITECTS

Experience in one or more of the following areas is required:

- Object-Oriented Development (SmallTalk, C++, OO A&D)
- GUI Design and Implementation (Visual Basic, Motif)
- Client/Server Systems (Windows, UNIX)
- Database Development, Administration and Tuning (DB2, Sybase, Oracle)
- Application Development (COBOL, C; UNIX or IBM mainframe)
- Telecommunications Customer Contact and Billing Systems
- CASE Tools (IEF, ADW)
- Software Process Re-engineering
- Business Process Re-engineering

We have positions available in New England; Birmingham, AL; and Fairfax, VA.

For immediate consideration, please send your resume, indicating position of interest and geographic preference, in confidence to: **AMERICAN MANAGEMENT SYSTEMS, INC., Telecommunications Industry Group, 12701 Fair Lakes Circle, Suite 800, Dept. CW-941114 Fairfax, VA 22033.** An Equal Opportunity Employer M/F/D/V.

AMS

AMERICAN MANAGEMENT SYSTEMS

Software Engineer: respnsbl. for developng. tsts. for Intel P6 ntl-genrtn. micrproc. systm. valdtn. tsts. ste.; devlp. parallel cache & synchrnzn. stress tsts. that valdat. new micrproc. in SMP configtrns.; respnsbl. for developng. parallel stress tsts. that valdat. new micrproc. under complx. condtns. similr. to stndrd. SMP oper. systms; eval. rsults. of tsts. & asst. w/micrproc. debugng.; specify extnl. logc. that will imprv. valdtn. for new micrproc. in SMP configtrns.; Min. 40/wk. Req.: B.S./Elec. Eng., Comprtr. Sc., or Comprtr. Eng. w/min. of 3 yrs. wrk. exp. in micrproc. devlpmnt., OR a M.S. Elec. Eng. or Comprtr. Sc. & no exp.; shared-memory multiproc. arch. & dsgn. w/emphss. on cache cohncy. & memry. constncy. issues; ably. to create & maintn. large progrms. in x86 protcd. mode assembly. & 'C', applyng. stndrd. ftwr. eng. princpls.; ably. to specify complx. tsts. cases for SMP comprtrs. exptlng. supersclr. procs. in hi-end dsk-tp. & servr.-like dsgns.; & ably. in trblshng. complx. ftwr. & hrdwr. errs. in SMP systms. w/multi-lvl. caches, multi-thrd. tsts., & multi. asynchrms. evnt. sources., \$3,770/mo.; job in Hillsboro, OR. Qual. applcns. send res. to: Employment Dept't., Attn: Job Order #5550817, 875 Union St., N.E., Rm. 201, Salem, OR 97311. Applicant must have legal authority to permanently wk. in US. Comp. is an Equal Opp. emp. & fully supports affirmative action practices.

Programmer/Analyst for computer consulting company in Central Ohio. Analyze existing info. systems/client practices to identify current/future systems requirements. Identify alternative info solutions to business problems using structured analysis & design techniques within framework of a standardized systems methodology. Develop technical specs. to describe logic, control flow, & algorithms. Code, test & debug systems components according to spec. & a predefined test plan. Perform maintenance & enhancement analysis & programming on existing systems components. BS/CS or BS/Info. Systems Science with emphasis on software engg. principles & techniques (at least 4 courses). Two yrs. combined exp., gained after undergrad degree involving: full life cycle development in business application environment; IBM Mainframe Computing (MVS, COBOL II, File-AID, XPEDITR, IMS or DB2); & PC computing (DOS/Windows, OS/2, & Micro FOCUS COBOL). All experience may have been acquired concurrently. In lieu of 2 yrs. exp., will accept 1 yr. exp. as above plus 1 year of relevant graduate courses in computer science in area of software eng'g. & database analysis & design. 40 hrs/wk. w/OT as needed. 8AM-5PM. \$41,500/yr. Must have proof of legal authority to work indefinitely in U.S. Send resume in duplicate (no calls) to G. Maugans, JOB#00319, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

GOING OUR WAY?

The Communications Super Highway. While others are just talking about it, Pacific Bell is building it! We're investing \$16 billion in California over the next few years to bring the hottest products to over 11 million customers. We're not just the phone company any more. We're a diverse information processing organization on the leading edge. And we have the following excellent opportunities available in the San Francisco East Bay.

TECHNICAL STAFF

Consumer Broadband Network

Our Product & Technical Support Group in San Ramon is implementing a video gateway for our consumer broadband network. This is a Unix based system controlling an ATM multiplexer using session control over a TCP/IP network. In addition to the specifics listed below, both positions require an MS in Computer Science and skills in Unix programming, object oriented programming (C++ design and implementation), and at least one of the following: TCP/IP, MPEG, ATM, or GUI. An MS in Engineering, Math or Physics is acceptable if you can demonstrate highly relevant experience.

Lead Member

To successfully lead 2 Software Developers as well as take responsibility for the laboratory instrumentation and computer controls for RF and telecommunications, you must also have experience in IPC over LANs in a multi-processor environment and experience working in a group software environment with version control systems. Laboratory instrumentation and MPEG or JPEG experience desirable.

Principal Member

This opportunity also requires extensive experience in one or familiarity with two or more of the following: GUI, SQL, version control systems, Unix utilities, Unix system and network administration, or Openwindows application programming. IPC experience and familiarity with JPEG or MPEG data protocols desired; integration experience a plus.

TECHNICAL DIRECTOR

Large Scale Computing/Data Center

We're looking for a technical and administrative leader to manage and guide a team of highly skilled system software programmers who provide 24 hour support for MVS online & batch systems in Fairfield and Anaheim. We're looking for a candidate with 5-8 years of experience in similarly challenging computing/data center environments. This technical leader will bring considerable experience in problem solving and recommending new directions and solutions. As part of your responsibilities, you will lead a team of Systems Programmers who utilize MVS RESVOL, system program products (i.e. JES2, ISPF/TSO/E, RACF, CA-1), VTAM, NDN, SMS/HSM, CICS, IMS, DB2, IDMS, Netview Automation, performance & tuning and database administration functions. A computer operations background is essential. This position is located in Fairfield.

We're excited about the future and the highway we're building to get us there. You too? Then E-mail your résumé into our database, mrea@PacBell.com (insert 10 "@" at beginning of résumé and include the word résumé in lower case on the subject line), fax it directly to our database (415) 243-0766 (use fine or extra fine mode if possible), or send your résumé & salary requirements to Pacific Bell Management Recruitment and Employment, 33 New Montgomery, Suite 1100, Dept. FD04, San Francisco, CA 94105. View this position and more! Internet address: (telnet) CAREER.com 8, NP, 1 stop bit. Pacific Bell is an equal opportunity employer. We value diversity in our work force and in the markets we serve.



©1994 Pacific Bell

PACIFIC BELL

A Pacific Telesis Company

CONSULTING

Contract Solutions is offering long-term consulting opportunities locally and throughout the United States. Most positions pay between \$80,000-\$130,000 per year.

- | | |
|-------------------------------|------------------------|
| ◆ORACLE FINANCIALS REL 9 & 10 | ◆VMS, ALL-IN-ONE |
| ◆ORACLE DBA | ◆IMS DB/DC |
| ◆TUXEDO, ORACLE | ◆DB2 DBA |
| ◆ORACLE, MANUFACTURING | ◆X.25, TCP/IP, PORTING |
| ◆ORACLE FINANCIALS DBA | ◆ORACLE CASE 5.0, 5.1 |
| ◆ORACLE REPORTWRITER 2.0 | ◆VISUAL C++ |
| ◆COBOL, DB2 | ◆SYS ARCH TELECOM |
| ◆OSF-1 SYS. ADMIN. | ◆UNIFACE |
| ◆MVS SYS PROGRAMMER | ◆ALPHA AXP/OSF1, C |
| ◆ORACLE V.7 FORMS 4.0 | ◆ADABASE DBA |
| ◆VMS, SYS. ADMIN. | ◆SAP R3 |
| ◆ACMS, C, VMS | ◆WINDOWS NT |
| | ◆MVS, CSP, DB2 |

Contract SOLUTIONS

Two Keewaydin Drive
Salem, NH 03079-4875
800-998-csi 1 (2741)

603-893-6776
FAX: 603-893-4208
email csinat@mv.mv.com

Consulting

KENTUCKY • OHIO • MICHIGAN • FLORIDA

PCS GROUP, a Sybase Teaming Partner is a recognized provider of management consulting, client server integration services, and a developer/marketer of such tools as Gen SPO & GDE© for Sybase, has immediate openings for consultants with at least three years of industry experience:

Client Server	Mainframe	Midrange
◆ Powerbuilder	◆ COBOL	◆ Synon
◆ Oracle	◆ VSAM	◆ AS400
◆ Oracle/Vax Cluster	◆ Easytrieve	◆ Wang Cobol
◆ Sybase	◆ DB2	◆ Pace
◆ SQR	◆ Natural	
◆ DBA	◆ Adabas	◆ Miscellaneous
◆ APT	◆ Focus	◆ Windows dev.
◆ C++	◆ IDMS	◆ Bachman
◆ Visual Basic	◆ CICS	◆ Foxpro
◆ C/Embedded SQL		◆ MicroFocus COBOL

PCS Group offers exceptional training opportunities in Sybase & Powerbuilder, outstanding incentives and excellent benefits. PCS Group is 100% committed to customer & employee satisfaction. Please send resume to: PCS GROUP, 9300 Shelbyville Road, Suite 1103, Louisville, KY 40222, 800-682-9784, 502-339-2900, FAX: 502-339-2888.

Equal Opportunity Employer

PCS GROUP

PROFESSIONAL CONSULTING SERVICES

Freightliner

Freightliner Corporation is the North American market leader in the design, development and manufacture of a complete line of technologically-advanced heavy trucks. We have the following opportunity at our **Portland, Oregon Headquarters:**

Senior Data Base Analyst

In our IMS, DB2, and SQL server environment, you will design and implement physical data base structures and provide technical consultation to applications personnel during all phases of data base development. **To qualify**, you must have a Bachelor's degree in Computer Science with at least 3 years' data base administration experience, **or** 2 years of related technical training with at least 5 years of progressive data base and applications programming. Experience with client/server applications is also desired.

The Freightliner Data Processing environment includes two large MVS/ESA main frames with IMS, DB-2 and a large national data communications network. These systems support both business applications and CATIA/CADAM for engineering. Microsoft Windows NT and IBM AIX platforms are being deployed for client/server applications.

Freightliner offers an attractive compensation and benefits package. For immediate consideration, please send your resume, to: **Freightliner Corp., Personnel Operations, PO Box 4750, Portland, OR 97208-4750.** You may also fax your resume to (503) 735-6657. EOE. No phone calls or agency referrals, please. M/F/D/V

FREIGHTLINER

FREIGHTLINER CORPORATION

**Where do
the best
computer
professionals
look for
jobs?**

**Weekly.
Regional.
National.
And it works.**

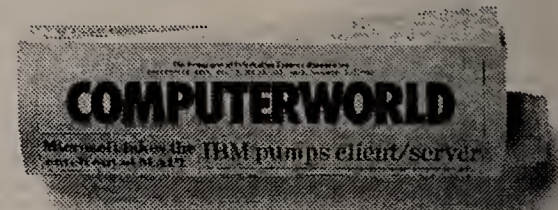
Right here.

In fact, more computer pros read more computer recruitment advertising in *Computerworld* than in any other newspaper.

Talk to the best.

Place your advertisement in *Computerworld*.

For more information or to place your ad regionally or nationally, call **Lisa McGrath at 800-343-6474; x 201** (in MA, 508-879-0700).

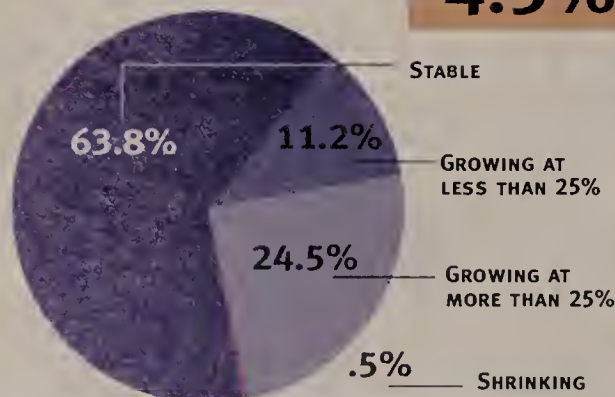


CAREER SURVEY: Factory Automation

INDUSTRY HIRING TRENDS

OVERALL GROWTH RATE

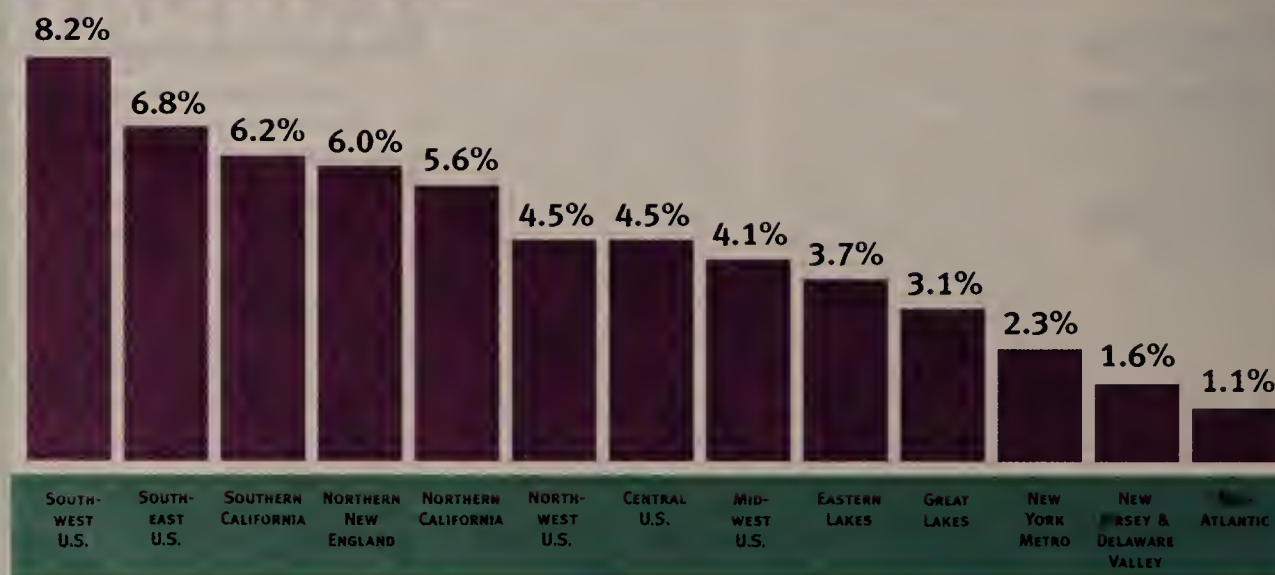
4.5%



SURVEY BASE: 420 TECHNOLOGY FIRMS INVOLVED IN FACTORY AUTOMATION

SURVEY CONDUCTED BETWEEN AUGUST '94 AND OCTOBER '94;

REGIONAL GROWTH ANALYSIS



CORPTECH, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S. 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 28,437 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., \$37,900/yr. Develop, code and test computer software application systems on TANDEM CYCLONE mainframes utilizing TAL and COBOL. Evaluate user requirements, perform external and internal design, and assist in implementation of the system. Requires Bachelor's Degree in Computer Science or Electronics Engineering. Reqr. 2 yrs. exp. in job offered, or 2 yrs. exp. as Systems Analyst/Programmer/Information Tech. Engineer. Reqr. work exp. in design and development of s/w systems on TANDEM mainframes utilizing TAL and COBOL. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 2995.

PROGRAMMER/ANALYST: (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., \$40,000/yr. Develop, code and test computer software application systems utilizing NON-STOP SQL on a TANDEM VLX or CLX mainframe utilizing C, COBOL and TAL. Install and maintain software and hardware. Requires Bachelor's Degree in Computer Science. Reqr. 1 yr. exp. in job offered, or 1 yr. exp. as Systems Analyst/Programmer/Software Engineer. Reqr. work exp. in development of s/w systems on TANDEM VLX or CLX utilizing TAL, COBOL85 and SQL. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 495

Programmer/Analyst - Oak Brook, IL. Analyze, design, develop, implement and maintain network systems. Provide technical support to end users. Utilize IBM mainframes; DB2, CICS, COBOL II, COBOL VS, OS/MVS and ABENDAD software. 3yrs/exp. in job offered. 40hrs/wk (8-5). \$38,000/yr. Must have proof of legal authority to work permanently in the U.S. Send resume in duplicate to: Illinois Dept. of Employment Security, 401 South State St. - 3 South, Chicago, IL 60605. Att: Len Boksa. Ref. #V-IL-12309-B. NO CALLS. AN EMPLOYER PAID AD.

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., \$45,900/yr. Analyze, design & develop computer software application systems on HP 3000/9000 and RS 6000 mainframes utilizing UNIX, MPE-XL, COBOL, C, and UNIFY. Prepare program specifications, test plan and data preparation, and assist in implementation of the system. Requires Bachelor's Degree in Computer Science or Electrical Engineering. Reqr. 3 yrs. exp. in job offered, or 3 yrs. exp. as Systems Analyst/Programmer. Reqr. work exp. in development of s/w systems on HP 3000/9000 and RS 6000 utilizing UNIX, MPE-XL, COBOL, C and UNIFY. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: S95.

SENIOR SOFTWARE ENGINEER: (2 positions) 40 hrs/wk. 8am-5pm, \$47,000/yr. Carry out analysis, design & development of computer software application systems on TANDEM and UNIX systems utilizing CLX, UNIX, COBOL, IRMX & TACL software. Perform the installation, testing & support of the software system. Requires Bachelor's degree in Computer Science or Electronics Engineering, and 5 yrs. exp. in job offered or 5 yrs. exp. as Programmer/Analyst/Manager/Support or Maintenance Engineer. Work experience with TANDEM & UNIX computer systems & with CLX, UNIX, COBOL, IRMX & TACL. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 129894.

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk. 8am-5pm, \$45,500/yr. Carry out analysis, design, coding and testing of computer software application programs on IBM mainframe utilizing CICS/VS, COBOL and DB2 environment. Requires Bachelor's degree in Computer Science, Electrical or Electronics Engineering and 4 yrs. exp. in job offered or 4 yrs. exp. as Information Technology Engineer/Programmer/Analyst. Work experience in developing application programs on IBM mainframe utilizing DB2, CICS & COBOL. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 8895.

PRODUCT DEVELOPMENT ENGINEER, PART MODELING For a Southwestern Ohio MCAE Company

DUTIES: Develop state-of-the-art applications and enhancements for Mechanical Computer-Aided Engineering (MCAE) and geometric modeling software products using the C, C++, and Fortran languages. Uses professional concepts and procedures to solve a wide range of complicated software engineering assignments in interactive graphics and geometric modeling. Defines and selects the software approach and implementation of large MCAE and geometric modeling applications utilizing advanced user interface and sketching techniques. Prepares design specifications, analysis, and recommendations for presentation and approval. Exercises judgement within generally defined practices and policies in selecting methods and techniques for obtaining solutions. Develops major routines and utility programs; occasionally provides technical supervision to junior members of the staff in completion of standard programming assignments. Normally receives minimum supervision on new tasks, and no supervision on routine tasks. **EDUCATION:** Master of Science in Mechanical, Electrical or Computer Engineering, Computer Science or Mathematics. The master's degree program must have included: (a) An aggregate of 15 quarter hours or equivalent semester hours in mechanical computer-aided design including CAD/CAM (computer-aided design/computer-aided manufacturing) utilization, interactive computer graphics, and geometric modeling including solid modeling and curve and surface representation. Any single course may satisfy two or more of these requirements. (b) At least 6 quarter hours or equivalent semester hours, in addition to the 15 quarter hours described above, of research resulting in a computer program utilizing geometric modeling in a CAD/CAM application. The computer program must have been implemented in the C, C++, or FORTRAN programming language. Completion of all degree requirements for a master's degree which requires a thesis except for final defense will be deemed equivalent to a master's degree. No experience required in the above duties but applicants will qualify with two years of experience as described hereinafter. Two years of experience in the job described or two years of experience involved in the development of mechanical engineering software for geometric modeling is required. The two years of experience required of the holder of the master's degree must include: a) 2 years work in the C or C++ programming language on a large application program (greater than 10,000 executable lines of code) for use by mechanical engineers; b) 2 years of programming experience in interactive computer graphics; and c) 2 years developing a sketching system utilizing advanced user interfaces for use by mechanical engineers to automatically capture design intent. The employer will accept, in place of one of the two years of experience in developing a sketching system, a master's degree thesis involving the development of a sketching system utilizing advanced user interface for use by mechanical engineers. A single period of experience may simultaneously satisfy two or more of these subject areas. The employer will accept in place of this two years experience in software development, a Ph.D. in any of the indicated major fields of study, or in aerospace engineering, provided that the graduate studies included: (a) An aggregate of 15 quarter hours or equivalent semester hours in advanced CAD/CAM topics including mechanical design, optimization, knowledge based systems and analytical design evaluation techniques (such as finite element methods, mechanisms analysis or tolerance analysis). (b) At least 45 quarter hours or equivalent semester hours, in addition to the 15 quarter hours described above, of doctoral thesis research resulting in a computer program utilizing geometric modeling in a CAD/CAM application. The doctoral thesis research must have involved the development of a sketching system utilizing advanced user interfaces for use by mechanical engineers to automatically capture design intent, including the development of user interface, graphics utilities, and geometry utilities. The doctoral thesis topic must have been in the area of mechanical design automation technology. Doctoral thesis topics may include geometric modeling, mechanical design principles and/or methods, feature modeling and/or recognition, design optimization, constraint management, application of knowledge based systems for mechanical design and/or manufacturing, design evaluation by analytical techniques, or a related area to those listed. The doctoral thesis research must result in a computer program implemented in the C or C++ programming language that verifies the result of the research. Completion of all degree requirements for a Ph.D. degree except for final thesis defense will be deemed equivalent to a Ph.D. degree. All applicants must read, write, speak and understand English. 40 hours per week, 8 a.m. to 5 p.m., Mon-Fri (exempt). **SALARY:** \$49,970-\$57,500. Must have proof of legal authority to work indefinitely in U.S. Send resume in duplicate (no calls) to J. Davies, JOB #00338, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216. EOE.

Software Engineer for a Southwestern Ohio geometrical modeling software company. Job duties to be performed: Development of an object oriented modeling system based on CLOS and LISP integrated with SHAPES solid modeller, and HOOPS 3D graphic visualizer under Motif and X on UNIX. Must have Master's degree in Computer Science with course work in Solid Modeling and Operating Systems. Must have one year experience in the job described or one year programming experience in using SHAPES, HOOPS, CLOS, LISP, C, Motif, Xlib and UNIX. 40hrs/wk, 9:00am to 6:00pm, Mon-Fri, \$41,500-\$43,600/yr. Must have proof of legal authority to work indefinitely in U.S. Send resume IN DUPLICATE (no calls) to J. Davies, JOB#00780, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216.

Programmer/Analyst - Majority of time at client locations in Cedar Rapids, IA; balance of time at client locations in Waterloo & Dubuque, IA. Analyze users' needs; design, develop, modify, test, debug applications & programs; provide technical support services as needed; use DB2, IMS DB/DC, COBOL II, Oracle. Bachelor's degree in Computer Science, Math or Engineering. 2 years experience. Must be willing to travel & relocate as needed (reimbursement by employer). 40 hours per week (9-6); \$45,000/year. OT as needed @ \$21.67/hour. Must have proof of legal authority to work in the United States. Send resume to: D.E.S. Workforce Center, P.O. Box 729 (800 7th St., SE), Cedar Rapids, Iowa 52406-0729. Please refer to Job Order IA1100308. Employer paid advertisement.

Programmer Analyst to prepare estimates for assigned tasks & projects; research & analyze customer needs & determine application requirements; design data structures, screens, transactions, reports & program specifications; develop efficient & cost effective applications using a 4GL; create, document & execute test plans; develop & maintain documentation; provide on-going maintenance & support to assigned projects; use Sybase 4.8, Uniface 5.2, SQR, UNIX & MS DOS client servers; Reqs: B.S. in Electronics, Communications, Comp. or Electrical Engng., Computer Science, Comp. Info. Sys. or Systems Analysis; 2 yrs in job offered or 2 yrs. related exp. as Assoc. Systems Eng., Info. Tech. Eng., Programmer Analyst/Systems Analyst or Consultant. Related exp. must include design & coding using Uniface 5.2 & UNIX, 1-1/2 yrs. related exp. must include using MS-DOS & 6 mos. related exp. must include developing software in SQR programming language & using Sybase 4.8; \$750/wk, 40 hrs/wk, 8a-5p. Must have proof of legal authority to work indefinitely in U.S. Send 2 resumes (no calls) to T. Do, JOB 00781, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

PROGRAMMER/ANALYST: (2 positions) 40 hrs/wk. 8 a.m. - 5 p.m., \$42,000/yr. Analyze, develop, code, and test computer software application systems on IBM 3090 mainframes utilizing CICS, DB2, SPUIF, COBOL and JCL. Requires Bachelor's Degree in Computer Science or Computer Engineering. Reqr. 1 yr. exp. in job offered, or 1 yr. exp. as Systems Analyst/Programmer/Software Engineer. Reqr. work exp. in development of s/w systems on IBM m/f utilizing CICS, DB2, COBOL, SPUIF and JCL. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 126594.

Opportunities from Anchorage to Austin... and Beyond.

Only one company can offer you so many opportunities in so many places...CTG. With offices throughout North America and Europe, we're putting the power of information to work for prestigious clients around the world. Here's your chance to be a part of it.

ANCHORAGE, AK

• ADABAS/NATURAL • DB2
• DBA • SYBASE • ORACLE
• PREDICT • CONSTRUCT

SEATTLE, WA

• INGRES • VISUAL BASIC • DB2/IMS
• POWERBUILDER • ORACLE • C++

PORTLAND, OR

• ORACLE • IDMS/ADSO • NOVELL
• VAX/COBOL • C/ASSEMBLER
• AS/400

SAN JOSE, CA

• CASE TOOLS • DB2
• LOTUS NOTES • OS/2 LAN
• C/UNIX • IDMS/ADSO

SALT LAKE CITY, UT

• COBOL • CICS • VSAM
• IMS • DB2 • PEOPLESOF

PHOENIX, AZ

• IMS DB/DC • SYBASE DBA
• COBOL, CICS • DEC/VAX • FOCUS
• DB2 • POWERBUILDER

ST. LOUIS, MO

• COBOL • CICS • DB2
• LOTUS NOTES
• POWERBUILDER
• VISUAL BASIC

KANSAS CITY, MO

• COBOL • CICS • IMS
• DB2 • PROGRESS • ADABAS

DES MOINES, IA

• COBOL • CICS • DB2
• POWERBUILDER • SYBASE
• ORACLE

OMAHA, NE

• COBOL/CICS • DB2
• VISUAL BASIC • PACBASE
• POWERBUILDER • AS/400
• IMS DB/DC

DENVER, CO

• COBOL • CICS • DB2
• UNIX • C • C++

AUSTIN, TX

• TECH SUPPORT
• PROGRESS • CADENCE
• C/UNIX • AS/400 • OS2/C/C++

HOUSTON, TX

• ORACLE • PROGRESS
• POWERBUILDER • PEOPLESOF
• INFORMIX • SMS

DALLAS, TX

• ASSEMBLER • IMS/DB2
• ADABAS/NATURAL • COBOL, CICS
• OOP, OOD, C++ • INFORMIX

For more opportunity, in more places, look to CTG. We offer excellent compensation and benefits, including paid overtime. For more information, send your resume, indicating location of preference, to: CTG, Regional Sourcing Center, 1507 LBJ Freeway, Ste. 140, Dallas, TX 75234-6069. Fax: (214) 919-1598. EOE M/F/D/V. For information about opportunities nationwide, contact the regional sourcing manager nearest you: Northeast: (315) 463-6276/Fax: (315) 463-0437, South: (404) 263-3400/Fax: (404) 263-3434, Midwest: (219) 756-6360/Fax: (219) 756-6377, Midatlantic: (919) 851-9008/ Fax: (919) 851-5701.

ctg

Programmer/Analyst - client site locations in Cedar Rapids, IA; balance of time at client locations in Moline, IL and Waterloo, IA. Analyze users' needs; design, develop, implement, test programs, applications, software; perform database administration; use DB2, C, CICS, IMS DB, LOTUS NOTES. Bachelor's degree in Computer Science, Engineering or Math. 2 years experience (must include 2 years using DB2, C, CICS, IMS DB and 6 months using LOTUS NOTES). Must be willing to travel/relocate as needed (reimbursed by employer). 40 hours per week (9-6); \$48,000/year. OT as needed @ \$23.03/hour. Must have proof of legal authority to work in the United States. Send your resume to D.E.S. Workforce Center, P.O. Box 729 (800 7th St., NE), Cedar Rapids, Iowa 52406-0729. Please refer to Job Order IA1100309. Employer paid advertisement.

OPTIMIZER ARCHITECT needed for parallel database research and development projects. Primary duties involve design and implementation of the parser and query optimizer for a highly parallel multi-processor relational database engine, and other projects related to performance and functionality enhancement. Requires a Ph.D. in Computer Science with specialization in databases; advanced coursework and research involvement in database query languages and optimization techniques; and demonstrable working knowledge of object-oriented programming concepts and competence with UNIX and UNIX tools, C++, lex, yacc, SQL, and formal software lifecycle development processes. Salary \$52,000 per year, 40 hours per week, Monday-Friday, 8-5. Contact Idaho Department of Employment, Attn: Job Order Number: ID6176782, 317 Main Street, Boise, Idaho 83735.

Computer Consultant, Murfreesboro, TN. Review current manual systems for billing, inventory, payroll & acctg. Reengineer manual processes for automation. Perf requirement analysis. Perf systems analysis & design. Implement, install & maintain software. Prov configuration management. Test & enhance system. Train end users. Reqd Masters in Comp Science or Comp Systems Management. 9 mos exp in job or 9 mos as Graduate Research Asst. Exp must include Paradox, Dbase IV, C++ language, database design & neural network, Lotus & Excel. 40 hr/wk, \$32,000/yr. Send resume to Kathy Malo, JO #TN1477105, Job Serv Prog & Tech Supp., TN Dept of Employment Sec, Nashville, TN 37245-1200.

ANALYST/PROGRAMMER (For Software Consultancy in Akron Ohio). Develop specifications. Analyze, design, develop, implement, test software. Reqr Bachelor's or equivalent (6 months professional experience = 1 yr academic) in Comp. Sc., Systems Analysis, MIS or Data Processing & 2 yrs exp in job or related occupation such as Systems/Analyst, Programmer. Exp must include MODEL 24 (File Management, User Language, System Management), CICS, COBOL 2, PL/I. \$38,000/yr. 40hrs/wk. 7:15am-4:00pm. Must have proof of legal authority to work indefinitely in the U.S. Send resume in duplicate (no calls) to T. Do, Job #00573, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus OH 43216.

The Weather's Hot in Phoenix and so is PSC

Our Excellent staff has earned us a reputation as the top Consulting Company in Phoenix! We are looking for top-notch consultants to help us maintain our #1 spot.

If you have any of the following:

- IMS DB/DC, DB2
- CICS/DB2/DLI
- IEF
- HOGAN
- WALKER Accounting Package
- DB Excel Repository
- DB2 DBA
- SAS, COBOL
- TECHNICAL Writer

Contact Laurie Zinker, 4747 N. 7th Street, Suite 424, Phoenix, Arizona 85014.

Fax (602) 279-1161
or call (602) 279-4498
or 1-800-279-4498

We offer both excellent
salary and benefits.

PSC
PROFESSIONAL SOFTWARE
CONSULTANTS, INC.



“From some 600 responses generated by a recent Computerworld recruitment advertisement, we’ve already hired about 50 professionals who were direct replies -- and we’re still hiring from that advertisement.”

Jason K. Whitehair
Recruiting Manager/Systems Engineering
MCI Telecommunications Corporation

Having just celebrated its 25th anniversary and exceeding \$10.6 billion in revenue, MCI is not only the nation's second largest long-distance provider, but also the world's fifth largest carrier of international traffic. Because the Systems Engineering Division plays a strategic role in shaping MCI's technological future, Recruiting Manager Jason Whitehair relies heavily on *Computerworld* to help recruit leading-edge professionals.

“Dedicated to delivering premier customer service and the highest quality products, Systems Engineering provides systems and software development and support to all of MCI's domestic and international voice and data businesses. Everything from message processing and commercial billing ... to network management and control ... to MCI Mail ... and more. Take our Friends & Family program, for example. Our software applications are what keep track of millions of 'calling circles' and generate customized bills.

“Not limited to any one platform, we utilize the platform best suited to deliver each customer service. So I'm always looking to recruit systems engineers with at least five to seven years of experience in a wide range of technical environments. Because *Computerworld* is one of the best trade publications for staying on technology's leading edge, its readers are the professionals we're generally looking to recruit. When it comes to recruitment advertising, *Computerworld* delivers a much higher ratio of qualified candidates than daily newspapers or nontechnical publications.

“The vast majority of resumes generated by our *Computerworld* recruitment advertise-

ments are from very high calibre candidates. We're typically able to use 350 out of every 400 resumes we receive -- and that's a hit rate of nearly 90%. In fact, from some 600 responses generated by a recent *Computerworld* recruitment advertisement, we've already hired about 50 professionals who were direct replies -- and we're still hiring from that advertisement. For a single advertising investment, we've more than gotten our money's worth.

“After Systems Engineering moved from Washington, D.C. to Colorado Springs back in 1991, our *Computerworld* recruitment advertising has been instrumental in helping us hire more engineers than usual -- and hire them fast. And, since I'm still seeing activity as a result of a recruitment advertisement we ran five months ago, I know we get sustainable impact with *Computerworld*.

“As MCI continues to expand into the long distance market including data transmission, 800 service, international calling, and Personal Communications Services (PCS), we'll continue to rely on *Computerworld* recruitment advertising to attract the hard-to-find, highly qualified technical people our global business demands.”

Computerworld. We're helping Information Systems employers and qualified Information Systems professionals get together every week. Just ask MCI's Jason Whitehair.

To put Computerworld to work for your hiring effort, call John Corrigan, Vice President, at 1-800-343-6474. And place your hiring message where the qualified candidates look. Every week.

COMPUTERWORLD

Where the qualified candidates look. Every week.

1 800 343-6474
in MA 508 879-0700

TURNKEY SOLUTIONS demand TURNKEY WARRANTIES

Securing absolute performance guarantees from systems integrators isn't realistic, but you should expect more than simple pass-through warranties from component vendors

By Steve Spears

When you hire a plumber to install a sink, you expect it to work. But if it doesn't, does the plumber blame the problem on the sink manufacturer and leave it at that?

Like most professionals who cobble together whole systems from individual components, plumbers guarantee that the parts they choose will work together. So isn't it reasonable to expect the same from a systems integrator?

Hired to create turnkey solutions, a systems integrator's goal is to meet the functional requirements stated in a request for proposals (RFP). Sometimes they reach this goal, and sometimes they don't. But how can a company avoid getting a system that isn't up to snuff? The answer: Go beyond the RFP and review the specific warranties involved before signing the contract.

For example, many systems integrators offer "pass-through" warranties that are originally provided by the hardware and software vendors for the individual components. Because pass-

through warranties are limited to individual products, in nearly every instance they exclude problems caused by combining products.

As you know, individual components may operate as warranted but fail to provide the functionality listed in the RFP. For example, an inventory control system may count units by weight but still not meet a company's needs because it cannot track inventory by additional units of measurement such as cartons and rolls.

In this case, pass-through warranties don't cover the problem because the software functions as warranted by the original vendor. The problem lies not in the software design, but in how it is configured and used. Other times, hardware and software may be poorly matched, failing to provide fast-enough responses to data entry and requests.

A systems integrator is hired expressly to assemble combinations that the original hardware and software vendors exclude from their warranties. That's why it's wise to negotiate an integrated systems warranty.

The purpose of such a warranty is to have each party agree on a reasonable allocation of risk, not to secure an absolute performance guarantee. Each party should be primarily responsible for providing the information it knows best.

The following suggestions will help you get closer to the full system coverage you want. If nothing else, they will open the dialogue between you and your integrator, letting you learn the limits of your integrator's performance in advance.

Focus the RFP on the results rather than on the means — that's the systems integrator's responsibility.

I've seen 800-page RFPs clearly detail products and features but never mention the desired end result. The choice of hardware, software, network configuration and implementation can be left to the systems integrator. Just be clear about how you want the system to work.

The RFP should come with a two- to 10-page cover statement listing the key system functions required. For example, state whether the system needs to be compatible with existing hardware or software, the data fields and general formats in which information must be organized and presented, how long you can afford to transition to the new system, how you expect to convert your data to the new system and the skill level of the people who will use the new system.

Assemble warranties in a single document.

Ask the systems integrator to put the individual warranties from the hardware and software vendors in a single attachment to your contract. This will help highlight gaps among the various pass-through warranties.

Your contract should also make some reference to the RFP as the standard of performance. Pass-through warranties cover only what the vendor wants to give, not necessarily what you requested or

what the systems integrator promised. By identifying these coverage gaps, you will be prepared to negotiate for the necessary coverage.

Provide for adequate testing and remedies.

A warranty is only as good as the remedies it provides if breached. Therefore, it's important to allow ample opportunity to test the new system before abandoning the old one. For a little leverage, consider withholding part of the payment until the system has proved itself.

In addition, reserve the right to turn to another integrator if your initial choice isn't up to the task. Consider what to do with the system chosen by your initial integrator if your replacement integrator urges you to use different hardware and software.

While most systems integrators won't take back a system, it may be a reasonable request, depending on the circumstances.

Ask for a written warranty.

Asking for a written warranty may cause a systems integrator to carefully review and limit its warranty. While the warranty may not go as far as the handshake agreement or sales promise, it will tip you off to any reservations the integrator may have.

It's unlikely that a systems integrator will offer an unqualified guarantee that a software and hardware configuration will meet every need. Moreover, the integrator may be justified in limiting its warranty because of a lack of information.

For example, a systems integrator could reasonably exclude failures that result from incorrect or inadequate information received in the RFP. A negotiated written warranty will get you more of the protection you want and let you know in advance where that protection ends.

Spears is a Chicago-based lawyer responsible for contracts and licensing at a computer and communications technology company.

Networking Management

**WHEN A WARM BOOT
DOESN'T WORK...
THERE'S ALWAYS**

THE PC-100

**FOR A PERSONALLY
GUIDED DEMO CALL:
1-800-776-4346**



**LodeStar
Technologies Inc.**

- Remote power cycle 1 to 1,024 devices from single line
- User ID/Password Security, with device database
- User programmable power sequencing
- Dial-Back: individual power loss, temp, UPS on battery
- VT100 Emulation, 2400 Baud built in modem
- Internal battery backup
- Current verification on each device
- 30 Day Money Back Guarantee, One Year Warranty

Network Management Tools

FILEAUDITOR® TELLS ALL!

**WHO GOT INTO
WHAT FILES, WHEN?**

FileAuditor enhances your network security by...

- ▲ Tracking file and directory activity on the network.
- ▲ Having proactive network security with NLMAuto or NLMerlin
- ▲ Denying access to specific files.
- ▲ Generating custom reports.

If you need enhanced network security

Call: **1-800-333-8698**

FAX: (602) 545-0008
Knazall Systems, 375 E. Elliot Rd, #10 Chandler, AZ 85225

A Division of Tangram Enterprise Solutions



Networking Hardware

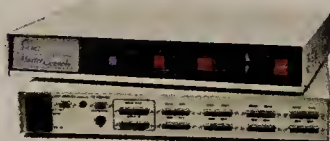
CONTROL ALL YOUR PC SERVERS

FROM ONE KEYBOARD, MONITOR AND MOUSE

with *MasterConsole*®

**COMPARE QUALITY
AND PRICE PERFORMANCE**

- Save Space, Cut Costs & Centralize Control with 100% Reliability
- "Plug and Play" Any Mix of PCs & All Video Supports PS/2 Mouse & Serial Mouse
- Desktop or 19" Rack Mount Models for 2, 4, 8, 16, PCs, Expand to 64
- Keyboard & Mouse Emulation Insures Error Free PC Operation & Automatic Booting
- AUTOSCAN™ to Monitor All PCs
- Remote Access up to 150 Feet
- Thousands in Use Worldwide GSA Schedule for U.S. Fed. Govt.



Come
see us at
Comdex in
Las Vegas
Booth #
L5000

CALL TODAY!
(908) 874-4072 x 39



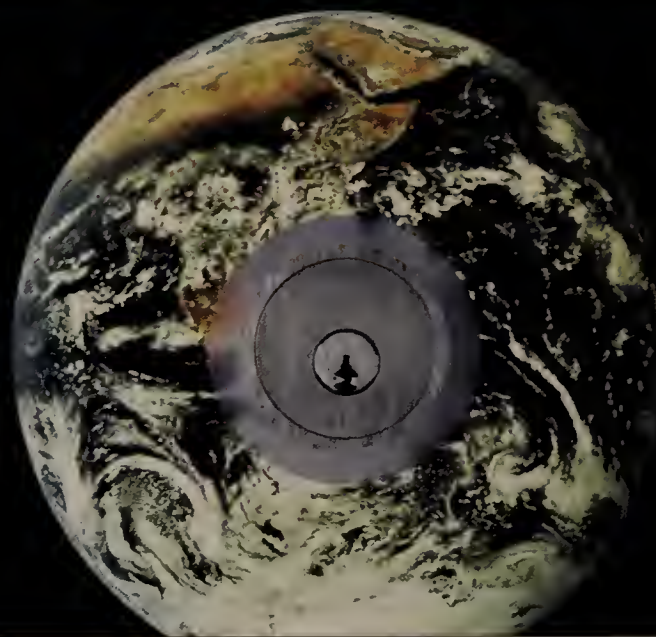
RARITAN COMPUTER INC.

10-1 Ilene Court, Belle Mead, NJ 08502 FAX (908) 874-5274

"No other solution
stacks up."

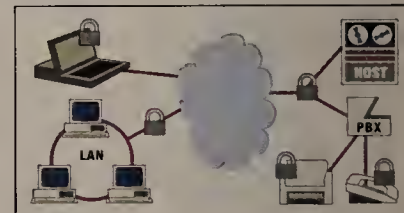
30 DAY MONEY-BACK GUARANTEE 1-YEAR WARRANTY

Network Security & Wireless Bridges



Cylink has the world locked up.

You can secure your information globally. You just need the right security partner. Only Cylink has spent the last ten years building a support organization in over 80 countries—working successfully with local governments, customs, and communications infrastructures. We can secure everything from applications on a laptop to global wide-area networks, from telephones to high-speed data links. We secure information for most of the world's money center banks, Fortune 500 companies, and government, police, and military organizations. Because of our experience, it's easier than you think to keep your information safe. Cylink Corporation, 910 Hermosa Court, Sunnyvale, California, USA, 94086. Telephone: 408-735-5800, FAX: 408-720-8294, Toll-free (USA): 800-533-3958. Worldwide sales & support.



England: Cylink, Ltd., Hampshire—TEL: +44-256-841919 • FAX: +44-256-24156
Singapore: Cylink Corporation—TEL: +65-336-6577 • FAX: +65-334-1429
© 1994 Cylink Corporation. Cylink is a registered trademark of Cylink Corporation.

CYLINK

Mainframe Connectivity

FREE!

NEW Brix 3270 DEMO DISK

**3270 SNA
Emulation
Software for
Windows™**

Access IBM mainframe applications from your PC.

- 3270 and Telnet 3270 clients for Windows 3.1
- File transfer and print
- Point & click programming
- 100% Winsock-compliant
- Graphical keyboard mapper
- Allows interactive query of applications like TSO, CICS, IMS, and NetView

CALL 1-800-BRISTON
CNT/Briston Systems, Inc.



File Server Cabinetry



The ultimate ways to protect your
nerve center.

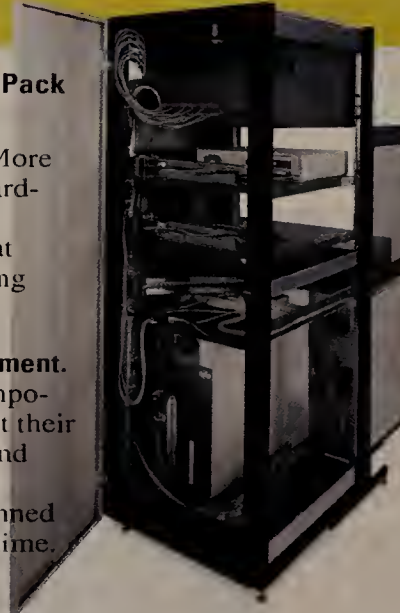
The APEX DensePack

**Maximize space,
minimize hassle.** More floor space, less hardware clutter with modular design that towers over anything else available.

Protect vital equipment. Keep sensitive components performing at their best and avoid unplanned downtime.



Made in
U.S.A.



**Instantly access
equipment for
efficient servicing.** Install components or repair hardware by simply extending drawers or shelves.

We're available to consult with you, creating CAD drawings to tailor the perfect cabinet system for your computing environment.

Innovation & Technology
by Design



For more information call: 1-800-861-5858

4580 150th Avenue NE • Redmond, WA 98052 • Fax: 206-861-5757

NEW!

Three for the show.

An
Inc.
500
Company**SPECIAL
OFFER**

Affordable color! Our most popular product just got even better. Better wall-sized true-color projection at the same unbeatable price. The BOXLIGHT ColorShow 1200 is our best seller for a good reason - value!

BOXLIGHT 1200. \$2,299

- ◆ 24,389 vibrant colors
- ◆ Universal PC and Mac compatibility
- ◆ Compact, portable design
- ◆ FREE remote control and cables
- ◆ Brightest color at any price
- ◆ Now with faster mouse response!

BOXLIGHT 2100. \$6,299

All-in-one! Convenience is the key with the new BOXLIGHT ProColor 2100 integrated LCD projector. Outstanding brightness without the need for an overhead projector. Built-in video AND audio for true multimedia. Automatic dual-lamp changer means the show always goes on. A high-performance solution at a tremendous introductory price.

**INTRO...
PRICE**

- ◆ 16.8 Million colors!
- ◆ Built-in video convertor
- ◆ Built-in audio amp & speaker
- ◆ Optional wide-angle lens
- ◆ FREE Remote control & cables

**MULTIMEDIA
READY**

Price Performance! Over 600,000 colors and built-in audio make your presentations and meetings come alive with wall-sized video and room-filling sound. Super-fast response times, VESA Local bus video compatible. Need we say more?

BOXLIGHT 1500. \$3,799

- ◆ 16 million colors, 600K simultaneously
- ◆ Built-in audio amp & speaker
- ◆ Rugged, lightweight metal case
- ◆ Projects from PC, Mac or VCR
- ◆ Model 1300 without video/audio - \$2,999!

**BOXLIGHT: Your direct source
for all the bright answers.**

- ◆ More than 50 models in stock
- ◆ Instant availability
- ◆ Overnight shipping
- ◆ 30-day guarantee and extended warranties
- ◆ Expert technical support

**No one else offers the one-stop shopping...the selection...
the value...the immediate delivery...
and the knowledgeable service and support you get from
the projection panel experts.**

The Inc. 500 logo is a registered trademark of Goldhirsh Group, Inc.

**BOXLIGHT™
CORPORATION**

17771 Fjord Dr. N.E., Poulsbo, WA 98370 • 206/779-7901
Payment: VISA, MasterCard, American Express, COD and
Purchase Orders (some restrictions). Leasing and rental
options available. 30-Day Money-Back Guarantee.

Call today 1-800-762-5757

Buy / Sell / Lease

When Stellar Performance Counts

Since 1980, Star has offered immediate availability on new and refurbished IBM equipment at prices that aren't out of this world. Call us and we will show you why we are ...

"The Brightest Star in the Midrange Industry"

- | | | |
|---------------------|------------------------|--------------------------|
| ★ AS/400 Systems | ★ System/36 Features | ★ New IBM Terminals |
| ★ AS/400 Features | ★ IBM DASD | ★ New IBM Controllers |
| ★ RS/6000 Systems | ★ IBM Tape | ★ New IBM Modems |
| ★ RS/6000 Features | ★ IBM Lexmark Printers | ★ New UDS & Codex Modems |
| ★ System/36 Systems | ★ IBM Pennant Printers | |

1-800-548-5421 EXT 730**STAR DATA SYSTEMS**

888 Isom Road ★ San Antonio, TX 78216

TEL: (210) 341-8114 FAX: (210) 341-9754



Time and Services

Most Vendors have well-equipped data centers...

They have large systems with the software you need, plenty of MIPS, and UPS systems.

ONLY ONE WILL EXCEED YOUR EXPECTATIONS!

- Only one runs your work as its own.
- Only one minimizes your risk and maximizes your cash flow.
- Only one will get the job done totally.

CSC CompuSource - dedicated to outsourcing since 1980.

**YOU'RE IN CONTROL WHEN YOU PUT US
IN CONTROL!**

CSC

CSC CompuSource
A Unit of Computer Sciences Corporation

110 MacKenan Drive
Cary, North Carolina 27511
919.481.9341

Buy / Sell / Lease

BUY • SELL • LEASE • RENT**IBM Systems • Peripherals • Parts & Service****SPECIALIZING IN:**

- ▶ **RISC System/6000®**
- ▶ **Workstations**
- ▶ **Parts & Features**
- ▶ **AS/400®**
- ▶ **Novell Networking**
- ▶ **Sun & Dec**
- ▶ **Personal Computers**
- ▶ **Data Communications**
- ▶ **UPS Systems**
- ▶ **Peripherals & Upgrades**
- ▶ **System 36 Conversions**
- ▶ **AutoCad**

NEW & USED IN STOCK

Complete Technical Center,
Installation, Stock Parts &
Features for RISC.

Authorized Distributors

for: **Seagate • Xerox**
Kingston • Cal Comp
Motorola • UDS/Codex
Decision Data Products

8 Nationwide Locations

A Publicly Traded Company
NASDAQ: MKPL

Computer Marketplace
prides itself on being
your one-call computer
hardware solution.

**COMPUTER
MARKETPLACE**

TEL (909) 735-2102 • FAX (909) 735-5717
1490 Railroad Street • Corona, CA 91720

800-858-1144

as cd **IBM** Trademark
CDLA CBE

MARKETPLACE

Buy / Sell / Lease

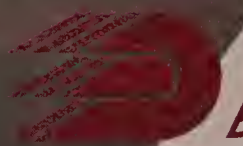
Dempsey: Where IBM® Quality is Second Nature!

- AS/400
- INDUSTRIAL PC
- RS/6000
- SYSTEM/36
- SERIES/1
- 9370
- ES/9000
- PS/2 & VP

Sales & Rentals

- Processors
- Peripherals
- Upgrades

For pretested equipment, flexible financing, configuration planning, technical support and overnight shipping call.



**Dempsey
BUSINESS SYSTEMS**

18377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648
(714) 847-8486 • FAX (714) 847-3149

IBM
Authorized
Distributor Products
Integrator

IBM is a registered trademark of International Business Machines Corporation.

(800) 888-2000

Large Systems Computers & Peripherals



New & Used

- **Computers**
- **Peripherals**
- **Upgrades**

• ES/9000

• SERIES/1

• AS/400

• RS/6000

• SYSTEM/88

• Point Of
Sale

...and more!

Buy • Sell • Rent • Lease



SPECTRA
(800) 745-1233

(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

amdahl

Cisco

Concurrent

Data General

digital

HDS Hitachi

hp HEWLETT
PACKARD

Memorex-
Telex

Prime

Silicon
Graphics

Stratus

Sun

TANDEM

TEXAS
INSTRUMENTS

UNISYS

XEROX

Outsourcing / Remote Computing

ALICOMP, INC.

The "Boutique" of the Computer Services World

Outsourcing Remote Computing

VM, MVS, VSE

Two State of the Art Locations:

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Outsourcing/Remote Computing

Outsourcing/Remote Computing

CONSULTEC
INC.

Whether its Transitional or
Long Term Outsourcing,
we invite you to see why
Consultec is

The Logical Choice

MVS/ESA-CICS-TSO-DB2-IMS

Contact: Tom Robinson
1-800-358-2381 ext.337
in GA. 404-594-7799

9040 Roswell Road Atlanta, GA 30350

Product Locator

**THE EASIEST WAY TO FILL ALL
YOUR DIGITAL COMPUTING NEEDS**

FREE TO USERS!
GUIDE LISTING
75 EXPERIENCED
INDEPENDENT
COMPANIES

⇒ THEIR LOCATION
⇒ SERVICES PROVIDED
⇒ WHO TO CONTACT

SEE US AT BOOTH #430
DECUS ANAHEIM
OR CALL FOR YOUR COPY



BROUGHT TO YOU AS A SERVICE OF DDA, A NON-PROFIT TRADE
ASSOCIATION SERVING THE DIGITAL INDUSTRY SINCE 1982

800-332-1130 FAX 313-475-4671

Outsourcing / Remote Computing

OUTSOURCING REMOTE COMPUTING

Extensive Software Library

Telenet Tymnet
Advantis Compuserve

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

Extraordinary Customer Service
Migration Management

708-574-3636

New England 617-595-8000

815 Commerce Drive, Oak Brook, IL 60521

**FANEUIL
SYSTEMS**

Outsourcing

If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part - or all - of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.



The Outsourcing Group

A Unit of American Software USA
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770

Get Instant Access to - Computerworld Introducing CW Online

Computerworld introduces CW Online, a comprehensive, fully searchable library of Computerworld articles. With CW Online, you can search the three most recent years of Computerworld issues. And the service is updated weekly, so you can access new information every week. Research has never been so easy, so complete or so economical. Right from your personal computer.

The Online start-up kit costs just \$25.00 and includes everything you need to start using CW Online including easy-to-use communications software. After that, you'll be charged for access time along with a \$5.00 monthly account service fee. You can even set your account up for us to bill your credit card or invoice your company on a monthly basis.

Call today to enter your subscription to CW Online and to receive your CW Online start-up kit with valuable communication software.



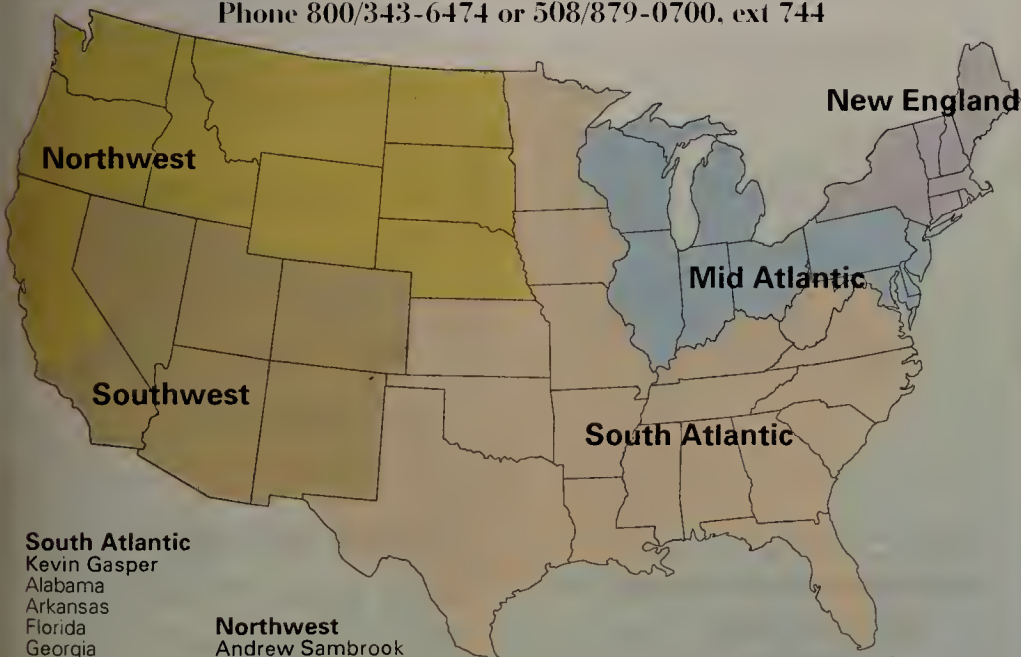
Electronic access to a library of Computerworld articles

For more information or to order call
800-343-6474 x81-493 today.

COMPUTERWORLD Marketplace

Reach more buyers by stretching your ad budget with our charter rates! Your Computerworld Marketplace Account Executive has all the colorful details—call today

Phone 800/343-6474 or 508/879-0700, ext 744



South Atlantic
Kevin Gasper
Alabama
Arkansas
Florida
Georgia
Iowa
Kansas
Kentucky
Louisiana
Minnesota
Mississippi
Missouri
North Carolina
Oklahoma
South Carolina
Tennessee
Texas
Virginia
West Virginia

Northwest
Andrew Sambrook
Alaska
Idaho
Montana
Nebraska
North Dakota
Northern California
Oregon
South Dakota
Washington
Wyoming
British Columbia
Alberta
Manitoba
Saskatchewan

Southwest
Claude Garbarino
Arizona
Colorado
Hawaii
Nevada
New Mexico
Southern California
Utah

New England
Susan Cardoza
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

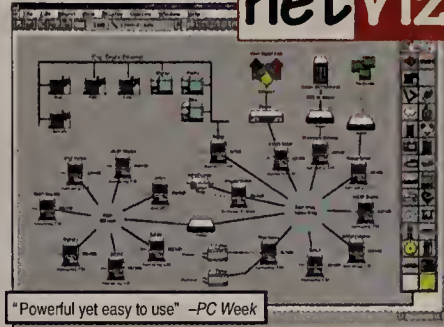
New Brunswick
Newfoundland
Ontario
Quebec

Mid Atlantic
Michelle Reeves
Delaware
Illinois
Indiana
Maryland
Michigan
New Jersey
New York City
Long Island
Ohio
Pennsylvania
Washington, D.C.
Wisconsin

Novell YES Partners

Network Diagram Tool

Diagram, document networks
& systems with **netViz**



"Powerful yet easy to use" -PC Week

- Intuitive drag-&-drop interface saves loads of time
- Embed descriptive data within graphic objects
- Multi-level capability handles complex structures

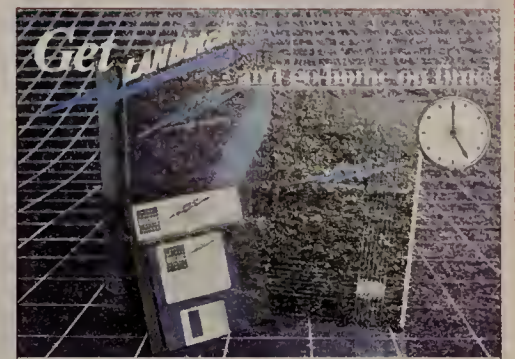
Free demo version of netViz!

- CompuServe: GO WINAPD; download file NVDEMO.EXE.
- Internet: Send message to ftpserver@his.com (no subject needed), message contents "get nvdemo.exe". File will be sent to you.
- After download: At DOS prompt, type "nvdemo". From Windows, run "setup".

\$395. 30-day money back guarantee.

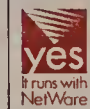
1-800-827-1856 Quyen Systems, Inc.

Batch Processing



Mainframe-Style Processing Scheduled Computing for LAN's

For data downloads, program compiling, off-hours back-ups. Report generation, virus scans and more! Runs any DOS .BAT, .EXE or .COM. Runs on: Netware 2.x, 3.x, 4.x, Trial version available with 30-day money back guarantee. Call today!



KeyLogic

INCORPORATED
PH (800) 641-4066 • FAX (603) 497-3785

Virus / Security Protection

**ALL
STOP
VIRUSES**

Violating This Law Could
Cost You More Than 2
Points and \$49.00

**It Could Cost You
Your Job!**

EMD Armor™

PC and Network Protection. Stops Boot Viruses. Hard Disk Protected from Virus Formatting. Continuous Virus Activity Monitor. Correct Power Up insured by CMOS Protection. Virus Protection During File Copying/Executing. Password Protection Prevents Changing, Or Using Private Files. Conventional Memory Not Used!

Ask About Our Corporate
"Try Before You Buy Policy"

EMD Enterprises (410)583-1575, ext3020
Fax Back...extension 4, document #1015



**Winner
of the
Industry's
Most
Prestigious
Awards based upon
Editorial Content and
Quality...Again.**

★ **Best Computer Industry
Newspaper 1994 Computer
Press Awards**

★ **Best Computer Industry
Newspaper 1993 Computer
Press Awards**

★ **Publication of the Year 1992
Magazine Week Editorial
Excellence Award**

**For Over 26 Years, the
Leader in the IS Market
and the Flagship
Publication of
IDG Publishing!**

Bid / Proposals

MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg, Suite 508, Jackson, MS 39201 for the following:
RFP 2663 due Tuesday, December 20, 1994 @ 3:30 P.M. for the acquisition of hardware/software to automate the functions of the Office of Disability Determination Services as mandated by the Social Security Administration for the Mississippi Department of Rehabilitation Services. No Charge.
RFP 2664 due Wednesday, December 8, 1994 @ 3:30 P.M. for the acquisition of a turn-key system including applications software, system hardware, Local Area Network hardware and software, installation, training and support services, for the automation of legislators' chamber and committee activities for the Mississippi State Legislature. Mandatory pre-bid conference Monday, November 28, 1994, 1:30 P.M., Mississippi State Capitol Building, Room 408. Interested parties should contact Ed Foresman, CDPA Procurement Analyst, by Wednesday, November 23, 1994, for information on additional mandatory requirements. No Charge.
Vendors may request RFPs with no charge by calling Linda Watkins at (601) 359-2604. CDPA reserves the right to reject any/all bids and to waive informalities.

Bid / Proposals

CITY OF NORFOLK, VIRGINIA

Proposals will be received by the City of Norfolk, Purchasing Agent, Room 607 City Hall Building, 810 Union Street, Norfolk, Virginia 23510 for the following:
RFP 8616 due by 1:00 P.M. Thursday, January 5, 1995 for the acquisition of software and/or implementations services for a comprehensive Human Resource/Payroll System. The proposed system should include personnel, payroll, time and attendance, position control, employee benefits, applicant tracking, employee relations, staff development, training and budget projections.
A pre-proposal conference will be held at 11 A.M. on December 5, 1994. For information contact James Waller at (804) 441-2431.

APPLICATION DEVELOPER'S TOOLBOX

Looking for...

...Application development tools from an experienced developer?

The AD Toolbox has just what you're looking for ...flexible, portable, and maintainable tools for your environment/platform. Simply locate the developers providing your solutions - and give them a call.

And, if you're a developer with solutions to sell,
call **800/343-6474, ext 744**.
Then watch the AD Toolbox go to work - for you!

OBJECT ORIENTED

Learn C++ & Windows™ Based Programming... Simply, Quickly!

With the OML Learning Series™ you can learn C, Visual C++™, object technology and Windows™-Based programming quickly and conveniently in the privacy of your home or office. The OML Learning Series features:

**Visual Series™, C/C++ Series™
OOA/OOD Series™, OLE Series™**

Each series: **\$245*** (reg. \$400)
Any 2 series: **\$395*** (reg. \$750)
Any 3 series: **\$545*** (reg. \$1050)
All 4 series: **\$645*** (reg. \$1300)
LAN version: Call

* Limited Time Offer

Call us for information
and FREE Demo Software.

800-6789-OML

Ask about our
low cost LAN package.



OML LEARNING SERIES
Object Technology Made Simple



**OBJECT
MANAGEMENT
LABORATORY**
TEL: 818-879-9620
FAX: 818-879-1860

PARALLEL PROCESSING

AWAKEN THE GIANT



BLACKBIRD

- Save Millions On Main Frame Time
- Increase The Worth Of Your Networked PCs
- Utilize What You Know To Minimize Training
- Speed Up Compute Intensive Applications
- Off Load Data Intensive Applications
- Utilize Millions Of Unused CPU Cycles
- Runs On PCs With Microsoft Windows, NT
- Link In UNIX Workstations
- Provides A Blackboard Architecture
- Supports Parallel Processing Primitives
- APIs In C

NORRAD, Inc.

33 Indian Rock Road
Windham, NH 03087
1-800-5 NORRAD
1-603-434-3979 FAX
Solutions For Industry



DATA ENTRY SOFTWARE

✓ -OUT VIKING DATA ENTRY

Before replacing yours, check-out the Viking Data Entry (VDE) System. Half of *Fortune* magazine's top 50 companies, numerous U.S. and foreign government agencies, and data entry service bureaus worldwide have discovered the benefits of VDE:

- Faster, easier keyboard entry and verification
- Insure accuracy with advanced data validation
- Multi-platform: MS/DOS, UNIX, VMS
- Save costs ... replace mainframe data entry
- Real-time "Customer Care" support

Call now for our **VDE Features
& Functions Checklist**

Compare VDE features with
an existing system or one you're
considering buying.

Viking Software Services, Inc.

800-324-0595

Ph:918/491-6144 • Fx:918/494-2701

COBOL TOOLS

SE/One

**ORDER
SE/One
NOW.
Only \$495**

The COBOL Program *understanding* tool. Find data routine problems. Metrics, structure analysis, interactive analysis, coding quality assessment, standards compliance. For maintenance and quality assurance.

800-457-3113

Fax: 404-667-9417

Software Eclectics, Inc.

Suite 131, 10955 Jones Bridge Rd.
Alpharetta, GA 30202-7343

Application Development...

Critical software technologies, including products that enhance the development of mission - critical client/server applications, are of primary interest to IS professionals. With today's focus on maximizing productivity, these professionals - Computerworld readers - are looking for proven application development tools. Fast sophisticated tools for designing, developing, and implementing complex applications for today's diverse environments.

WINDOWS IMAGING

IMAGE BASIC



Imaging Magazine
Product of the Year

- Customize ALL aspects of your imaging system using Visual Basic, SQL Windows, Visual C++, or dBase for Windows
- Industry standard components are in use by over 120,000 users
- 30-day money-back guarantee eliminates risk of trying product

DIAMOND HEAD SOFTWARE, INC.
Call: 1-800-IBTOOLS Fax: (808) 545-7042

WINDOWS IMAGING

**What's the Best-read
Newsweekly among IS
Professional?**

**Simmons
Says...
Computerworld.
Again!**

**Call for Complete Details!
Computerworld
Marketplace
Call 1-800-343-6474,
ext 744**

PROGRAMMING HURDLES

**Getting You
Down?**

*You've Turned
to the
Right Place!*

Because...every week, you'll
find the right tools for the right
jobs — right here.

In the new

**Application
Developer's Toolbox
in Computerworld
Marketplace.**

■ Tools to build applications
that are portable across a
multitude of platforms.

■ Tools that speed
application development
and make programming
much less painful.

■ And tools for mission-
critical applications
that improve your
organization's
competitiveness.

**So turn here again
next issue — and
every issue —
for expert help in
overcoming your
programming hurdles!**

PRINT STREAM MGMT

**Enhance the Productivity of Your
Legacy Applications**

**Introducing StreamWeaver™... the latest
in print stream management technology.**

With StreamWeaver, you can change your
output without changing your applications.
The benefits are clear:

- Combine output from multiple business
applications without costly programming
changes
- Increase the productivity of your legacy
applications
- Extend the life of your mainframe
- Works with all IBM and IBM-compatible
mainframe applications

Reduce costs. Increase efficiency. Call
(800) 624-5377



A Pitney Bowes Company

StreamWeaver is a product of PDR Automated Systems and
Publications, Inc.

Application Development...

Critical software technologies, including products that enhance the development of mission - critical client/server applications, are of primary interest to IS professionals. With today's focus on maximizing productivity, these professionals - Computerworld readers - are looking for proven application development tools. Fast sophisticated tools for designing, developing, and implementing complex applications for today's diverse environments.

401(k) ADMINISTRATION

DELTA DATA SERVICES, INC.
(800) 451-9188

Defined contribution administration software for the plan sponsor. Interfaces with payroll to administer 401K, ESOP, thrift, and profit sharing plans. Daily or periodic processing, distributions, loans, ADP/ACP testing. User defined statements, voice response. Runs on AS/400.

ACCOUNTING

M • A • S 90 EVOLUTION/2 Accounting Software at Discount Prices?

Pay **DISCOUNTED** prices for the premier accounting solution. Industrial strength G/L, A/P, A/R, Payroll (with multiple city/state taxation), J/C, P/O, Sales Order, Point of Sale, Inv Mgmt, Time & Billing, many others. Dos/Windows/UNIX platforms supported.
CORLOR Development, Inc. (505) 281-7151

APPLICATIONS CONVERSION

AUTOMATED CONVERSION SPECIALISTS

DOS to MVS HONEYWELL to IBM
MACRO to COMMAND CSP to COBOL/CICS
RPG to COBOL COBOL to COBOL II
PL/1 to COBOL CENTURY EXPANSION
Other Platform/Language Conversions
BELCASTRO COMPUTER SERVICES, INC.
800-521-2861 218-852-1828

MIGRATION - CONSOLIDATION

SERVICES:
VSE to MVS Migrations/MVS Re-Design
Data Center Consolidations
DFSMS Migrations
Project Management
COBOL/VS to COBOL/II/370 Conversions
Systems Integration & Re-Design, Inc.
(504) 834-2293

APPLICATIONS DEVELOPMENT

APPLICATION DEVELOPER'S TOOLBOX
See proceeding page in Marketplace.

Is your shop ready for the "Turn of the Century"?
..... (800) 999-0757

Tired of maintaining your legacy applications?
LPC..... (800) 824-5377

C++

C++ and Object Technology Training

5-day, on-site seminars on C++, Visual C++, Borland C++, OOA/OOD, Visual Basic, and C. We customize our courses to your needs. Contact us today for course outlines and pricing.

DEITEL & ASSOCIATES

deitel@world.std.com
Phone: (508) 877-0273 FAX: (508) 788-0937

C++ Training, Design, Emergency Code Repairs.
Rowe Technology (408) 375-9449

CLIENT SERVER DEVELOPERS

High performance OLTP design and implementation specialists.

We utilize memory resident databases, Sybase, SQL-Server and Oracle, as appropriate on Windows NTAS, Stratus/VOS/FTX and UNIX Servers with either Windows or Unix Clients.
Developers Edge Ltd. 1-800-EDGE-SYS

Re-Engineer NOW!!!

Let our highly motivated professionals help your corporation make the successful transition from your existing mission critical applications into object-oriented client/server systems. Powerbuilder, C/C++, Visual Basic, Sybase/Oracle/Informix. Imaging, Wireless, ISP.

Innovative Information Technologies, Inc.
1-800-352-2797

Innovision Technologies, Inc.

(PowerBuilder Specialists)(313) 591-7472
Quality Client Server GUI Applications. Development/Testing using formal methodologies. OOA, OOD, OOP, Integration Testing, System Testing, Acceptance Testing, PowerBuilder, C/C++, Auto Testing. Oracle, Informix, Sybase, Ingres.

Millennium Computer Corp. "Quality Solutions"
On Schedule, Within Budget(718) 248-0510

NIIT - Software Division (404) 804-8446

Developers of client server applications using Sybase and Oracle. Option for offshore software development available. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax: (404) 804-6445.

COMPUTER/TEL INTEGRATION

Computer/Telephone Integration

Consulting & Design.
Expert guidance for the medium to large call center environment. ANI/DNIS routing - Call/Data-screen synchronization - Caller Profile call routing. Functional Specifications-Design-Documentation.
Get it right the 1st time!
INSIGHT SERVICES 1-800-877-9024

CONTRACT PROGRAMMING

Client/Server Solutions using PowerBuilder, VAX/UNIX Acucobol. Accurate Data Systems (305) 864-3835

NASTEL Technologies

Prime source for cost effective, high quality, on-site/offsite software development. Expertise in Oracle, Informix, Sybase, Powerbuilder, Client Server applications, re-engineering (multimedia, windows) and CAD conversions. Reliable delivery. Excellent References.
(212) 251-0787 Fax 212-889-4950

SAVE 50%-70% ON PROGRAMMING

While using some of the most sophisticated programmers in the world. All customer contact handled in the U.S.
• Client Server
• New Application Development
• Updating & Porting to New Platforms
Typhoon Software, Inc.
800-499-0888

DATA RECOVERY

RANDOMEX Data Recovery Service

Hard Drives - Tapes - Floppies - Disk Packs
Crashes/Power Failures/Viruses/Fire
Average Turnaround 72 Hours
98% Success Rate On Recoverable Data
14 Years Experience * 23 Operating Systems
800-728-3889 (Long Beach, CA)
800-488-0893 (Boston, MA)

DATA WAREHOUSING

UNLOCKING THE POWER OF INFORMATION
Solvers Inc. (800) 999-4829

DISASTER RECOVERY

CHI/COR Information Management, Inc.
Recovery Planning Software (800) 448-8777

EDUCATION & TRAINING

NIIT - Training Division (404) 804-8446

Developers of custom Computer Based Training (CBT), Multimedia, and Performance Support Systems. Development site is ISO-9001 certified. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax (404) 804-6445.

Visual Basic, C++, OOA-OOD, ORACLE
Texas Software (800) 252-7007

EASY TECHNICAL UPDATING

50-Minute videos, \$29.95 each, on today's crucial topics (client/server, OOPS, software engineering, networking, AI) by over 40 leaders (Stroustrup, Bell, Knuth, Microsoft, etc.) CONTACT UVC, toll-free 1-800-900-1510 x1112; uvc.lemon@forsythe.stanford.edu. FREE CATALOG. SATISFACTION GUARANTEED.

ELECT. DATA INTERCHANGE

EDI software, consulting, & integration
Next Edition, Inc., 14+ yrs exp. (216) 498-0602

FAX-ON-DEMAND

COMPUTER-FAX INTEGRATION

Discover the Power of Fax-On-Demand, Increase Sales. Save 90% over past method. Delivery product literature upon request 24 hrs/day, 7 days/wk. Buy Fax-On-Demand Marketing Tool for the 90's to learn how. For more, call 408-243-2275, get Doc #210.
ABConsultants 1-(800) 982-3715

GROUPWARE LOTUS NOTES

Nationwide Professional Services
Summit Software Services, Inc. (503) 226-6250

I/T CONSULTING

ITM, Inc. (817) 489-3839

Focus: *Development Productivity, Data Management, Strategic Planning, Staff Augmentation*; Custom, business aligned methodologies (w/integ. Bus. Proc. Re-Eng. & Data Mgmt), Impl. Coaching, Meth. Educ.; CASE. GUI PowerBuilder (Dev. & Proj. Mgrs.), Info Modelers, etc. Data Warehousing & Admin., I/T Planning, Arch. Des.
We help you use I/T to create Business Value through Organizational Success.

MCBA

SYSTEMS DESIGN & SERVICES, INC. -

(708) 894-1674 Specializing in support, enhancements, upgrades, conversions. Established 1982. ALL applications, releases, versions, languages, operating systems. NEW! UNIX/AIX, AS/400 SOFTWARE FOR: ACCOUNTING, DISTRIBUTION, MANUFACTURING, HUMAN RESOURCES, 4GL

OFFSHORE SOFTWARE DEV.

COSTA RICA - "A BETTER WAY"

Low-cost, hi-quality offshore programming. Central Time Zone, 3 hour flight from USA. Satellite Links. Oracle, Visual Basic, Powerbuilder, Sybase, C++, COBOL, AS400.
Hestair, Houston (800) 448-7277

Hexaware Technologies -**A Blue Chip Resume:**

- * Client/Server technology focus
- Oracle, Sybase
- Powerbuilder, Uniface, Visual Basic
- * Complete Turnkey responsibility
- * Virtual 84 kbps data link from your office to India
- * State-of-the-art software development center in India....

Hexaware Technologies -**A Blue Chip Resume:**

- * Large pool of quality software talent
 - * International quality standards
 - * Success stories in US/Middle East/India
 - * Joint Venture option
- Tel: (609) 951-9195; Fax (609) 951-9638;
Partner for Success
Hexaware Technologies, Inc.
Princeton • Bombay • Bahrain • Dammam

Serving the Northwest USA

* Providers of quality software development. Options for Joint Venture. Services:
New Development Re-engineering
Migration Client-Server/PC/RDBMS
Testing/QA Product Enhancement
LINCROSS SOFTWARE SYSTEMS, INC.
(206) 238-5847
INDIA • SINGAPORE

Typhoon Software (800) 499-0888
(See our ad in Marketplace)

OFF-SITE SOFTWARE DEV.

Powerbuilder/ORACLE/SYBASE/etc. - C/S Applications
PowerSource, Inc. (806) 229-2554

OUTSOURCING

ALICOMP and CBS Data Services formed a business alliance to offer the highest level of technical, operational, and managerial expertise within a single mandate: loyalty and the highest quality computer services with flexible pricing.

ALICOMP/CBS

(800) 274-5556
(See Our Ad in the Marketplace)

Outsourcing/Remote Computing**IBM, MVS/ESA**

Transitional Outsourcing
Specializing in high online transaction environments, Multiple mainframes, Reasonable prices
Consultec, Inc.
Contact: Tom Robinson
(800) 358-2381

ISO 9001 CERTIFIED OFF-SHORE/ ON-SITE SOFTWARE SERVICES

Substantial cost savings on Development, Maintenance, Conversion, Rightsizing using Indian facility with in-house IBM 9000, AS/400, RS 6000, SUN and CICS, DB2, IMS, COBOL, RPG, SYNON, Oracle, Sybase, Visual Basic, Powerbuilder, Uniface, C++.

D Square Software, Inc.

Tel: (908) 632-2688 Fax: (908) 632-2692

FANEUIL SYSTEMS provides mainframe based Outsourcing and Remote Computing Services for well over a decade. Our reputation for providing high quality services in a flexible and cost effective manner is undisputed in the industry. Join the many others who have already made the right choice, call **FANEUIL SYSTEMS** at (708) 574-3636. (See Our Ad in the Marketplace Section)

OUTSOURCING/REMOTE COMPUTING

For 26 years we have nationally located outsourcing services on all platforms from over 2,000 data centers. **NEVER** a fee to our buyers because we are paid by our sellers. Call us today and join over 1,500 satisfied customers!

COMPUTER RESERVES, INC.

(800) 882-0988

FINANCIAL TECHNOLOGIES**COMPUTER SERVICES DIVISION**

(703) 631-4401

OUTSOURCING - REMOTE PROCESSING

Multiple IBM ES9000 Mainframes

MVS/ESA VM/ESA

Current Software Releases,

7 days/week, 24 hours/day

Quality Service - Competitive Pricing

MCRB Service Bureau, Inc.

3090 Computer Services (800) 941-MCRB

PC SOLUTIONS

Micro Focus COBOL, Dialog System, Panels2 solutions. Next Edition, Inc. (216) 498-0602

PURCHASING SOFTWARE

Commerce Software, Inc. (PurchaseSQL®)

Elmsford, NY (800) 447-7172

REMOTE COMPUTING

ALICOMP, Inc. (800) 274-5556
(See Our Ad in the Marketplace)

FANEUIL SYSTEMS provides mainframe based Outsourcing and Remote Computing Services for well over a decade. Our reputation for providing high quality services in a flexible and cost effective manner is undisputed in the industry. Join the many others who have already made the right choice, call **FANEUIL SYSTEMS** at (708) 574-3636. (See Our Ad in the Marketplace Section)

RIGHTSIZING

MCRB Service Bureau, Inc.

3090 Computer Services (800) 941-MCRB

SOFTWARE REENGINEERING

Reuse Your Existing Software Assets

- * Computer language translation and migration reengineering services converting into C, C++, Ada, and COBOL
- * Services guaranteed for: functionality; maintainability; price; delivery date.
- * Language and platform independent

Alydaar Software Corporation:

(504) 845-3322

SOFTWARE REUSE

RPM®**Reuse Process Manager®**

"a windows and C/S based process manager with a customizable environment for defining, measuring and practicing reuse-driven software development"

developed by Dr. Carma McClure

Extended Intelligence, Inc.

(312) 348-5245 x380



“...Computerworld Direct Response Cards consistently generate the highest profits of any deck we’ve tried.”

- Mary Cooper
Vice President
cfSOFTWARE, Inc.

A software developer based in Chicago, cfSOFTWARE has been providing communications solutions to computer professionals in the IBM and compatible arena for over a decade. Because *Computerworld* appeals to a large base of both mainframe and PC professionals, Vice President Mary Cooper just recently expanded the company's *Computerworld Direct Response Card* advertising to include all three of their communications products.

“To generate sales for Across the Boards, a communications toolkit for developing cooperative applications, and pcMAINFRAME, a generalized micro-to-mainframe file transfer system, cfSOFTWARE has been advertising in *Computerworld Direct Response Cards* almost from the very start. Now, based on our past success, we’ve also started to advertise pc2POWER, our newest file transfer system. Since all of our products facilitate mainframe-to-micro communication, we need to reach IS managers and technical support professionals on the mainframe side as well as end users on the PC side. That’s why *Computerworld Direct Response Cards*, with their large audience of buyers most apt to need our products, are one of our primary advertising vehicles.

“Clearly, *Computerworld Direct Response Cards* take the ‘hit or miss’ out of advertising by qualifying our audience for us. We call it our high-profile deck because we not only get high visibility and a high rate of response but also convert a high volume of leads into sales. With their excellent cost

per lead, *Computerworld Direct Response Cards* consistently generate the highest profits of any deck we’ve tried.

“In fact, we can always tell when our *Computerworld Direct Response Card* advertising hits because of the sudden surge in sales activity. Business really starts hopping with more phone calls and more mail. It’s a real morale builder! But most importantly, every time we advertise in *Computerworld Direct Response Cards* we receive well over 100 leads. Sometimes we even get responses six months later, so we know *Computerworld Direct Response Cards* have a long shelf life that gives cfSOFTWARE valuable exposure for building awareness and share of mind over the long term.

“While reasonable rates for color and multiple insertions add considerable appeal, the large quantities of quality leads generated by every card we run is our key incentive for stepping up cfSOFTWARE’s advertising schedule in *Computerworld Direct Response Cards*.”

Computerworld Direct Response Cards give you a cost-effective way to reach a powerful buying audience of over 139,000 computer professionals in the U.S. They’re working for cfSOFTWARE - and they can work for you. Call Norma Tamburrino, National Account Manager, *Computerworld Direct Response Cards*, at 201/587-8278 to reserve your space today.

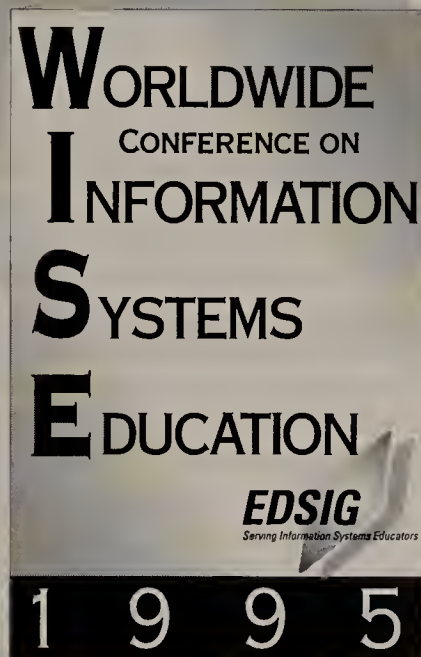
COMPUTERWORLD DIRECT RESPONSE CARDS

Where you get direct access to quality sales leads.



1 800 343-6474
IN MA 508 879-0700 x247

Conference Call



**EDSIG's Worldwide Conference on Information Systems Education
Suburban Denver, Colorado
June 11-14, 1995**

**For more information, call
1-800-488-9204**

*Clip and **FAX** this coupon to 1-508-875-3202 or call 1-800-488-9204 for more information.*

Please place my name on your mailing list, so I'll receive registration materials and information throughout the year.

Name _____ Title _____

Institution or Company _____

Address _____

City _____ State _____ Zip Code _____

Phone _____ Fax _____ e-mail _____

WISE

OBJECT WORLD

Objects In The Real World 1995

Reap the rewards of object technology. For your company. And yourself.

Caterpillar Inc. applied object-oriented analysis and design techniques to streamline the steel procurement process. ■ The Palm Beach Medical Examiner's Office took advantage of reusable objects to create a powerful object technology (OT) application—in record time. ■ Canadian Tire used OT to build a true client/server application that improved customer service and increased traffic in retail stores. ■ The fact is, thousands of organizations are already putting object technology to work in manufacturing, financial services, telecommunications, aerospace, defense, retail, transportation, and more. ■ Object World Boston—March 19-23, 1995—is your chance to discover how you can use OT to create distributed applications that improve performance, cut costs, boost profits, and build competitive advantage. ■ So register for Object World Boston today. And increase your chances for success.

Learn from case studies, OT users and expert panelists.

No other OT conference offers you a broader range of subjects or greater technical depth than Object World. You can choose from 15 tutorials and 54 conference sessions. Many are based on actual case studies and feature OT users and experts who'll share their knowledge and experience. Here is a sample of sessions organized into four separate tracks:

OBJECTS IN BUSINESS TRACK: Building the Business Case for Object Technology; Planning for Reuse; Strategic Issues in Transition Management; and The OT Dream Team.

TECHNOLOGY OF OBJECTS TRACK: A Case Study in Large Scale OT Development: Managing Complexity; Building Reusable Software Components; Managing OO Projects: Scaling Up from Small to Large; and Object Metrics: Current Practices.

DISTRIBUTED COMPUTING WITH OBJECTS TRACK: Bridging Client/Server and OO Computing; Choosing a CORBA Implementation; Planning for Large Scale DOC Environments; and Case Study: Xerox's Migration to Distributed Object Technology.

SOFTWARE DEVELOPERS TRACK: Incorporating CORBA into C++ Applications; Comparison of C++ and Smalltalk for Use with Object Databases; Case Studies: Detecting Software Development Failures and

Recovering; and Patterns and Frameworks: Elements of Reusable OO Software.

Hear from OT industry's movers and shakers!

Pick up valuable tips and techniques from the implementers who've brought OT from the back room into the mainstream and made it the technology of choice for IS departments. Don't miss presentations by Grady Booch, Peter Coad, Stephen Mellor, Ivar Jacobson, David Taylor, Andrew Topper, and Paul Harmon.

Get the inside story at our Bonus Sessions.

Learn the ins and outs of OT during several 45-minute Bonus Sessions including OMG: Building the Object Technology Infrastructure and Industries in Action—covering healthcare, financial services, and telecommunications.

Save \$200 on the full conference program. Register today.

If you sign up for the full conference program by February 17, you'll save \$200. But that's not all. You'll also get a FREE CD, *The World of Objects*, the definitive reference database for OT. Plus, you'll receive a book filled with money-saving coupons you can redeem for products and services—only at Object World.



UPDATE
No. 2

DON'T MISS THESE KEYNOTE PRESENTATIONS.



Jon Hopkins, President of Palladio Software, will conduct a panel discussion, "Theory Is Great—But Does It Get The Job Done?" Three methodologists will discuss how their peers' methodology addresses the issues related to object models and iterative development.



Steven A. Mills, General Manager of IBM Software Solutions, will explore the topic, "Objects: Not Just For Programmers Anymore." See how objects have become the driving force in the way software is developed, purchased, delivered, and maintained.



David Taylor, Ph.D., President of Enterprise Engines, will discuss "Business Engineering With Object Technology." Find out how companies are using OT to improve productivity and increase profits.

WAKE UP AND SMELL THE OBJECTS • March 19-23, 1995

Sign up for Object World Boston by February 17 and save \$200 on the full conference program. And get a FREE CD, *The World of Objects*—the definitive reference database for OT. It's worth the price of admission!

HOW TO RESERVE YOUR PLACE:

By Mail: Fill out this coupon and mail it to Object World Boston, P.O. Box 9107, Framingham, MA 01701.

By Phone: Call us toll-free at 800-225-4698 in the U.S. or 508-879-6700.

By Fax: For fastest service, fax this coupon to 508-872-8237.

By E-Mail: OMG@OMG.ORG.

Type the word "help" by itself in the body of your letter, and the server will send you complete instructions. To receive a list of available files, type the word "index" on a separate line.

By World Wide Web Server:

<http://www.idgwec.com>
Select Object World Boston.



Object World offers you a no-questions-asked, money-back guarantee on the full conference program, so you have absolutely nothing to lose. Reserve your place—and your \$200 discount—today.

Sponsored and Produced by:

IDG
WORLD EXPO

COMPUTERWORLD

OMG
OBJECT MANAGEMENT GROUP

To register or for more information, call 800-225-4698.

(Check one only)

- ☐ Reserve—without obligation—my \$200 discount on the full conference program.
☐ Please send me more information about the full conference program and register me for my FREE Exhibits Pass.
☐ Register me for my FREE Exhibits Pass—a \$50 value.
☐ I'm not ready to register at this time. Please send me more information about:
☐ Attending ☐ Exhibiting at Object World Boston.

Please print or type clearly.

Inquiry Code: CW6

Name _____

Title _____

Organization _____

Street _____

City/Town _____ State/Province _____

Zip/Postal Code _____ Country _____

Phone _____ FAX _____

Internet/E-Mail _____

© Object World is a registered trademark. No one under 18 admitted.



Computerworld, Inc.

CEO/President
Gary J. Beach

Executive Vice President:
Steven F. Woit

Senior Vice President/Finance:
Matthew C. Smith

Vice President/Human Resources:
Susan C. Perry

Executive Assistant to the CEO/President
Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher
Kevin McPherson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

Vice-President Editorial
Bill Laberis

Vice-President Sales/Associate Publisher
David Peterson

Vice-President Consumer Marketing
Gail Odeneal

PUBLISHER'S OFFICE: *Assistant to the Publisher*, Lois Beninati **SALES CLASSIFIED:** *Classified Operations Director*, Cynthia Delany **MARKETING:** *Director, Marketing Communications*, Mary Doyle, *Account Manager, Marketing Communications*, Elizabeth Phillips, *Manager, Trade Show & Conventions*, Audrey Shohan, *Marketing Communications Project Manager*, Susan Thaxter, *Administrative Assistant*, Patty White **CIRCULATION:** *Director of Circulation Management*, Maureen Burke **PRODUCTION:** *Production Director*, Christopher P. Cuoco, *Production Manager*, Beverly Wolff **DISTRIBUTION:** *Distribution Manager*, Bob Wescott, *Traffic Manager*, Pat Walker

Sales Offices

Associate Publisher/Vice-President/Sales
David Peterson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171 Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-879-0446

Northeast

Regional Vice President: Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, Sales Assistants: Alice Longley, Tammy Gryniewicz, Laura Holliday, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2915 TDD: (800) 428-8244

Mid-Atlantic

Senior District Manager: Fred LoSapio, District Managers: Vicki Gonin, Rich Molden, Sales Assistants: Susan Kusnic, Jean Dellarobba, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 TDD: (800) 208-0288

South-Atlantic

Regional Vice President: Bernie Hockswender, Sales Assistant: Jennifer Pattenauade, 3675 Crestwood Parkway, Suite 400, Duluth, GA 30136 (404) 931-8104 FAX: (404) 931-8106 TDD: (800) 449-4974

Midwest

District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3606 FAX: (312) 214-4962

Southwest

Senior District Manager: Darren Ford, Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882 FAX: (214) 385-1603 TDD: (800) 822-4918

Northern California

Vice President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook, District Managers: Christine Curry, Elizabeth Cooper, Lisa Kowalski, West Coast Operations Manager: Leticia Lehane, Executive Assistant: Denise Hui, Sales Assistants: Emily Gaytan, Shannon Dempsey, Denise Garcia, Andrea Zurek, Jim Schott, Colleen Molnar 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312 TDD: (800) 900-3179

Southern California

Southwestern Regional Manager: Fran Cowen, Sales Assistant: Aileen Lim, 19800 MacArthur Blvd., Suite 500, Irvine, CA 92715 (714) 757-4123 FAX: (714) 757-4124

Advertising Operations

Display Advertising Production Manager: Paula Wright, Display Advertising Coordinators: Lisa Tanner, Peggy Hennessy, Gregg Pinsky, (508)-879-0700 FAX: (508) 879-0446

Custom Publications

Boston: Vice President/Larry Craven, Director of Publishing Services/Carolyn Novack, Sales Assistant/Heidi Broadley, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446

Sao Francisco: West Coast Director/Elaine R. Offenbach, Sales Assistant/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Client/Server Journal

East: Sherry Driscoll, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171, (508) 879-0700 FAX (508) 872-2915

West: Kaye Sharbrough, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Marketplace Advertising

New England Account Executive/Susan Cardoza, **Mid-Atlantic** Account Executive/Michelle Reeves, **South-Atlantic**/Midwest Account Executive/ Kevin Gasper, **Northwest** Account Executive/Andrew Sambrook, **Southwest** Account Executive/Claude Garbarino, Marketing Communications Manager/ Karen Lesko, Solutions Directory/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-0941

Recruitment Advertising Sales Offices

Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, Account Executive/Nancy Mack, (800) 343-6474

Mid-Atlantic: Regional Manager/Marty Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Caryn Diott, (800) 343-6474 TDD: (800) 208-0288

South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (708) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474 TDD: (800) 227-9437

West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164, Sr. Account Executive/Christopher Glenn (800) 343-6474 TDD: (800) 203-5867

Computer Careers Online: Jay Savell, Account Executive, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

Direct Response Cards

375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

West: Account Manager/Jill Greer, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164

Computerworld Database Division

Vice President/General Manager, Customer Information Division: Richard Mikita, Vice President Sales: John Carpenter, Sales Assistant: Jennifer Chaus.

East: Account Executive VAR Database, Carol Mullen, Database Representative, Buyers Database, Linda Clinton, (508) 879-0700 FAX: (508) 879-0184

West: Account Executive VAR Database, Chris Jones, Database Representative, Buyers Database, Gena Haas, (415) 347-0555 FAX: (415) 347-8312

Response Technologies

President: Charles Coleman, Chief Operating Officer: Jaye Tyler, (508) 997-6206 FAX: (508) 992-6936

International Data Group

Chairman of the Board, Patrick J. McGovern; **President**, Kelly Conlin; **Chief Operating Officer**, Jim Casella; **Vice President Finance**, William P. Murphy

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 200 computer publications in 63 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina, AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Network World, Mobile Business Australia, Publish, Reseller, IDG Sources; AUSTRIA'S Computerwelt Osterreich, PC Test; BELGIUM'S Data News (CW); BOLIVIA'S Computerworld; BRAZIL'S Computerworld, Gamepro, Game Power, Mundo Unix, PC World, Publish, Super Game; BURGARIA'S Computerworld Bulgaria, Edworld, PC & Mac World Bulgaria, Network World Bulgaria; CANADA'S CIO Canada, Computerworld Canada, Graduate Computerworld, InfoCanada, Network World Canada, Reseller, CHILE'S Computerworld Chile, Informatica, COLOMBIA'S Computerworld Columbia PC World, COSTA RICA'S PC World; CZECH REPUBLIC'S Computerworld, Elektronika, Macworld, PC World; DENMARK'S Communications World, Computerworld Danmark, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Produktguide, Tech World, Windows World; ECUADOR'S PC World; EGYPT'S Computerworld(CW) Middle East, PC World Middle East; FINLAND'S Mikro PC, Tietoviikko, Tietoverkko; FRANCE'S Distributique, GOLDEN MAC, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecons & Reseaux; GERMANY'S Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Electronic Entertainment, Gamepro, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; GREECE'S Infoworld, PC Games; HONG KONG'S Computerworld Hong Kong, PC World Hong Kong; HUNGARY'S Computerworld SZT, PC World; INDIA'S Computers & Communications; INDONESIA'S Info Komputer; IRELAND'S ComputerScope; ISRAEL'S Computerworld Israel, PC World Israel; ITALY'S Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC Shopping Italy, PC World Italia; JAPAN'S Computerworld Today, Information Systems World, Macworld Japan, Nikkei Personal Computing, SunWorld Japan, Windows World; KENYA'S East African Computer News; KOREA'S Computerworld Korea, Macworld Korea, PC World Korea; LATIN AMERICA'S GameProp MALAYSIA'S Computerworld Malaysia, PC World Malaysia; MEXICO'S Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; THE NETHERLANDS' Computer! Totaal, Computable (CW), LAN Magazine, MacWorld, Totaal "Windows"; NEW ZEALAND'S Computer Listings, Computerworld New Zealand, Network World, New Zealand PC World; NIGERIA'S PC World Africa, NORWAY'S Computerworld Norge, CWorld, Lotusworld Norge, Macworld Norge, Network, PC World Ekspres, PC World Norge, PC World's Produkt Guide, Publish & Multimedia World, Student Data, Unix World, Windowsworld; IDG Direct Response, PAKISTAN'S PCWorld Pakistan; PANAMA'S PC World Panama; PERU'S Computerworld Peru, PC World; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Infoworld, China PC & Communications Magazine, Computer Fan, PC World China, Electronics International, Electronics Today/Multimedia World, Electronic Product World, China Network World, Software World Magazine, Telecom Product World; PHILIPPINES' Computerworld Philippines, PC Digest (PCW); POLAND'S Computerworld Poland, PC World/Komputer, PORTUGAL'S Cerebro/PC World, Correo Informatico/Computerworld, MacIn; ROMANIA'S Computerworld, PC World, Telecom Romania; RUSSIA'S Computerworld-Moscow, Mir-PK (PCW), Sety (Networks); SINGAPORE'S Computerworld Southeast Asia, PCWorld Singapore; SLOVENIA'S Monitor Magazine, SOUTH AFRICA'S Computer Mail (CIO), Computing S.A., Network World S.A., Software World; SPAIN'S Advanced Systems, Amiga World, Computerworld Espana, Comunicaciones World, Macworld Espana, NeXTWORLD, Super Juegos Magazine (GamePro), PC World Espana, Publish, SWEDEN'S Attack, ComputerSweden, Corporate Computing, Macworld, Mikrodatum, Natveek & Kommunikation, PC World, Publishing & Design (CAP), Datalingenjoren, Maxi Data, Windows World, SWITZERLAND'S Computerworld Schweiz, Macworld Schweiz, PC Tip; TAIWAN'S Computerworld Taiwan, PC World Taiwan; THAILAND'S Thai Computerworld; TURKEY'S Computerworld Monitor, Macworld Turkey, PC World Turkey; UKRAINE'S Computerworld, UNITED KINGDOM'S Computing/Computerworld, Connexion/Network World, Lotus Magazine, Macworld, Open Computing/Sunworld; UNITED STATES' Advanced Systems, AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Digital Video, DOS Resource Guide, Electronic Entertainment Magazine (E2), Federal Computer Week, GamePro, IDG Books, Infoworld, Laser Event, Macworld, Multimedia World, Network World, PC Letter, PCWorld, PlayRight, Power PC World, Publish, SWATPro, Video Event; VENEZUELA'S Computerworld Venezuela, PC World Venezuela; VIETNAM'S PC World Vietnam

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded-line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here

Address shown: ☐ Home ☐ Business

Name _____
Company _____
Address _____
City _____ State _____ Zip _____

Name	Company
Title	Company
Address	
City	State Zip

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002** Outside U.S. call (614) 383-3322). CompuServe members can reach us at account number 73373, 1230

Advertisers' Index

Amdahl	15
Anixter	63
AT&T Paradyne	29
AT&T	59-61, 80
Banyan	89
Candle Corp.	68-69
Canon	45
ComNet	108
Compaq	26-27, 102-103
Computer Associates	5, 50
Computron	95
CW On CD	48
CW Circulation	25
Dell	36-37, 52-55, 64, 138
Digital Equipment Corp.	18-19, 78-79, 111-114
Digitalk	81
Hewlett Packard	38
IBM	10, 70-71, 86-87, 98-99
Information Builders	104
Informix	31
Intergraph	24
Legent Software	32-33
Lexmark	42-43
Micom	84
Micro Focus	11
Microsoft	G1-G3
Motorola Codex	91
NEC Technologies	106-107
NetManage	56
Nokia	39
Novell	41, 82-83
Object World	134
Oracle Corp.	7, 9
Powersoft	72
Siemens/Rolm	C4
Sapiens	92-93
SAS Institute	17, 77
Sequoia Systems	67
Software AG	105
Sybase	13, 46-47, 74-75
Syncsort	3
3Comm	22-23
Tektronix	20
U S Sprint	21
Watcom	C3
Windows World Open	100

This index is provided as an additional service.

The publisher does not assume any liability for errors or omissions.

Marketplace Advertisers' Index Pages 115-133

Alicomp, Inc.	(800) 274-5556
American Software	(800) 264-5770
Apex PC Solutions	(206) 861-5858
Boxlight	(800) 762-6757
Brixton Systems	(800) BRITTON
Computer Marketplace	(800) 858-1144
CSC Compusource	(919) 481-9341
Computer Site Technologies	(800) 226-0784
Consultec	(800) 358-2381
Cylink Corp.	(800) 533-3958
DDA	(800) 332-1130
Dempsey Business Systems	(800) 888-2040
Fanul Systems	(708) 374-3636
Knozzall Systems	(800) 333-8698
Lodestar Technologies	(800) 776-4316
Raritan Computer Inc	(908) 874-4072 x39
Spectra Equipment	(800) 745-1293
Star Data	(800) 548-5121

Companies in this issue

Page number refers to page on which story begins

3M Co. Cover1,14
3M Optical Systems 44

A

ACI US, Inc. 81
Action Technologies, Inc. 96
Adlux Advertising, Inc. 90
Advanced Micro Devices, Inc. 16
AdvanEdge Technologies, Inc. 96
Advanta Corp. 96
Affiliated Computer Services, Inc. 66
Allied Signal Technical Services Corp. Cover1
America Online, Inc. 6
American Cyanamid Co. 57
American Home Products 57
American Management Systems, Inc. 65,73
Amerisure & Cos. 2
Andersen Consulting 73,96
Apple Computer, Inc. 2,6,66
Aquiline, Inc. 44
Arbor Software Corp. 6
Areeda Software, Inc. 49
ARSoftware Corp. 81
ASK Group, Inc. 65
AST Research, Inc. 8
Astra/Merek 24
AT&T Corp. 14
AT&T Global Information Solutions 14,96
Attachmate Corp. 39
Autodesk, Inc. 2,39
Avid Technology, Inc. 30

B

Bankers Trust Co. 90
BASF Corp. 90
Baxter Healthcare Corp. 90
BCM, Inc. 90
Bell Atlantic Corp. 8
Bellecore 58
BIS Strategic Decisions 51,96
BMC Software, Inc. 24
Boole & Babbage, Inc. 69
Borland International, Inc. 4,44,76
Brandywine Network Associates 57
Broadview Associates 28
BT 8
Business Systems Group 16

C

Cabletron Systems, Inc. Cover1
CACI Products Co. 101
Cadis, Inc. 66
Camarro Research 139
Cambex Corp. 69
Casio, Inc. 44
CD PubCo., Inc. 76
Charles Schwab & Co. 57
Chevron 14
Cheyenne Software, Inc. 49
Chicago Board of Options Exchange 8
Ciba Textile Products Corp. Cover1,15
Cincom Systems, Inc. 76
Circle K Corp. 8
Clearlook Corp. 44
CogniTech Services Corp. 8
Cognos Corp. 4
Compaq Computer Corp. 14,30
CompHealth, Inc. 85
CompuUnique, Inc. 49
CompuServe, Inc. 6
Computer Associates International, Inc. Cover1,65
Computer Intelligence InfoCorp 39
Computervision Corp. 8
Compuware Corp. 4,24
Constellation International 44
Control Data Systems 8
Coopers & Lybrand L.L.P. 8
Corning, Inc. 85
Countrywide Funding Corp. 10
Cray Research, Inc. 69,76
Crystal Semiconductor 39
Currid & Co. 57,139

D

D. H. Andrews Group, Inc. 10
DataLead Communications, Inc. 90
Dataquest, Inc. 39,49,76
Datatec Industries 94
Decisis, Inc. Cover1
Deloitte & Touche 94
Delphi Consulting Co. 96
Digital Communications Associates, Inc. 40,51
Digital Equipment Corp. Cover1,2,16,28
Digital Pathways, Inc. 58
Dow Chemical Co. 8
Du Pont Co. 2
Duke Power Co. 57
Dun & Bradstreet Software 30
Dynamics Research Corp. 101
Dynasty Technologies, Inc. 4

E

Eastman Kodak Corp. 66
Educational Testing Services 90
Educum Cover1
Eeco Products, Inc. 8
Electronic Data Systems Corp. 73
ElseWare Corp. 39
Enix Ltd. 101
Entergy Corp. 2
Enterprise Rent A Car Co. 10
Evergreen Technologies, Inc. 51
Expersoft Corp. 73

F

Fenwick & West 66
First Albany Corp. 14
First Colony Life Insurance Co. 30
First Virtual Corp. 62
Ford Motor Co. 94,96
Forrester Research, Inc. 2,28,30,65
Forte Software, Inc. 2
Foster Ousley, Conley 65

G

Gartner Group, Inc. Cover1,15,20,40,58,96
Gateway 2000, Inc. 12
Gateway Consulting 96
General Electric Co. Cover1,8,96
Genesys Software Systems, Inc. 69
Geodyssey 76
Geoworks, Inc. 44
Global Software, Inc. 69
Graphical Bytes, Inc. Cover1
GTE Corp. Cover1,15
GTE Labs 73
Gupta Corp. 2,20,109

H

Hale and Dorr 30
Hayes Microcomputer Products, Inc. 139
Heidrick & Struggles, Inc. 8
Hewlett-Packard Co. Cover1,2,8,24,57,73
Hitachi America Ltd. 49
Hitachi Data Systems Corp. 66
Honeywell, Inc. 40
HRI Companies 90
Human Communications 139
Hurwitz Consulting Group, Inc. 65

I

IBM PC Co. 40
IBM Cover1,2,4,8,10,15,16,28,30,40,
62,65,66,69,73,76,94,96,137
Illinois Power Co. 20
Independent Service Network International 66
Individual, Inc. 14
Information Builders, Inc. 96
Informix Corp. 4
Informix Software, Inc. Cover1,15,65,76
Insource Management Group 30
Insource Technology Corp. 30
Intel Corp. Cover1,2,16,39,49,66
Interfacing Technologies Corp. 96
Intergraph Corp. 2

International Data Corp. 2,4,28,30,39
ITT Hartford Life Cos. 73

J

Johnson & Johnson 96
JYACC, Inc. 4

K

KnowledgeWare, Inc. 30
Kolvox Communications, Inc. 40
KPMG Peat Marwick 58,65
Kurzweil Applied Intelligence 40

L

Land's End, Inc. 62
Logix Works, Inc. 96
Lotus Development Corp. 14,39,58

M

Madge Networks, Inc. 62
Martin Marietta Corp. 96
Matrix Partners 30
MCA/Universal 90
MediaLogic ADL 49
Medtronic, Inc. 4
Mega Drive Systems, Inc. 49
Melillo Consulting, Inc. 81
Mercer Technologies 4
Merek & Co. 24
Merrill Lynch & Co. 68
Meta Group, Inc. Cover1,4,14,15,51,58
Metropolitan Life Insurance Co. Cover1,15
Micro Modeling Associates 90
Micrographix, Inc. 96
MieroMall, Inc. 62
Microsoft Corp. Cover1,2,6,8,14,15,16,39,
40,44,49,58,65,66,76,81,137
Minnesota Supercomputer Center, Inc. 69
Mips Technologies, Inc. 2
Mobil Corp. 96
Moody's Investor Service 40
Motorola, Inc. 2,6,66

N

Nation's Bank Services, Inc. 96
National Data Corp. 90
National Investment Management 6
Navistar International Transportation Corp. 66
NetLabs, Inc. 57
Network General Corp. Cover1,62
Next Computer, Inc. 8
Nokia Mobile Phones, Inc. 44
Novell, Inc. 4,16,28,49,58,73,109,137

O

Object Management Group 73
Ocean Isle, Inc. 137
Ontos, Inc. 76
Open Software Foundation 73
Oracle Corp. Cover1,4,8,15,24,30,
58,62,65,68,76,96,109
Orlando Health Care 49
Oxford Associates 96

P

Pacific Bell Cover1,57
Panttaja Consulting, Inc. 51
Patricia Scybold Group 73
Petrochemical Open Software Corp. 8
Popkin Software & Systems, Inc. 101
Portable Software Corp. 44
Powersoft Corp. Cover1,4,15,
20,68,76,109
Prima Hotels 90
PrimeSource Corp. 51
Procom Technology, Inc. 49
Procter & Gamble Co. 8
Progress Software, Inc. 4
Proportional Software 44
Protege Corp. 44

Q

Qualitis, Inc. 44
Qualix Group, Inc. 76

R

RCI Management, Inc. 90
Redken Laboratories, Inc. 90
Reebok International Ltd. 96
Robertson, Stephens & Co. 4
Rubbermaid, Inc. 90

S

Schreiber Foods 85
Seagate Technology, Inc. 30
Seurity Dynamics, Inc. 58
Seer Technologies, Inc. 4
Sequoia Systems, Inc. 28
SHL Systemhouse, Inc. 73,76
Silicon Graphics, Inc. Cover1
Simware, Inc. 51
Smith Barney Shearson, Inc. 137
SoftArc, Inc. 58
Software 2000, Inc. 69
Software AG of North America, Inc. 96
Spectron Microsystems 39
SRA International 101
Stae Electronics 137
Stark Realities 4
Storage Technology Corp. 66
Strategic Solutions Group 49
Stratus Computer, Inc. 28
Summit Strategies, Inc. 2
Sun Microsystems, Inc. Cover1,2,68,69
SunSoft, Inc. 16
SureCheek, Inc. 90
Sybase, Inc. Cover1,4,15,20,65,68,69
Symantec Corp. 76
SynOptics Communications, Inc. 57

T

Tandem Computer Co. 28
Tandy Corp. 41
Tatung Science & Technology, Inc. 2
Telebyte Technology, Inc. 44
Teleport Communications Group 68
Texas Instruments, Inc. Cover1,4
Texas Microsystems 28
TGV, Inc. 58
The Aerospace Corp. 6
The Amerisure Cos. 85
The Carson Group 6
The Chase Manhattan Bank NA 4
The Leading Hotels of the World Ltd. 90
The Travelers Corp. 4
The Travelers Insurance Co. 85
The Yankee Group 51
Tivoli Systems, Inc. 57
Toray Optical Storage Solutions 49
Toshiba Corp. 28
Trinzic Corp. 14,81

U

Uni-Data and Communications, Inc. 8
Union Bank 14
UniSQL, Inc. 8
Unisys Corp. Cover1
US West Marketing Resource Group, Inc. 6
UUNET Technologies, Inc. 28

V

V.I. Corp. 81
Verbex Voice Systems 40
ViewSoft, Inc. 81
Visual Systems Development Corp. 109
VMark Software, Inc. 6
Voice Information Associates 40

W

Weiss Associates, Inc. 85
Whitetree Network Technologies, Inc. 62
William M. Mercer, Inc. 4
Wilson, Goodrich & Rosati 66
WordPerfect Corp. 39,40
Workflow Management Coalition 96
Worklink, Inc. 14

X

Xerox Corp. 8,96
Xionics, Inc. 44

Gainers Losers

Percent

ROSS SYSTEMS	31.9	PINNACLE MICRO INC.	-26.2
GUPTA	22.0	BROCK CONTROL SYSTEMS INC.	-17.1
INFORMIX CORP.	19.1	CE SOFTWARE (L)	-14.3
AUTODESK INC.	18.6	WEITEK	-12.9
DATARAM CORP.	18.6	QUARTERDECK OFFICE SYS.	-12.8
BACHMAN INFO. SYSTEMS	18.5	MANUGISTICS GROUP INC.	-12.7
ZEOS INTERNATIONAL LTD. (H)	17.6	V MARK SOFTWARE INC.	-12.0
PLATINUM SOFTWARE	16.5	COMPRESSION LABS INC.	-11.1

Dollar

FORE SYSTEMS INC. (H)	7.50	PINNACLE MICRO INC.	-4.25
POWERSOFT (H)	6.38	SYBASE INC.	-3.75
AUTODESK INC.	6.00	COMPUWARE CORP.	-2.63
INFORMIX CORP.	4.63	GENERAL DATACOMM INDS.	-1.88
DIGITAL EQUIPMENT CORP.	4.38	V MARK SOFTWARE INC.	-1.88
STRATACOM INC.	4.00	AT&T	-1.63
PEOPLESFT	4.00	BROCK CONTROL SYSTEMS INC.	-1.63
LOTUS DEVELOPMENT	3.63	SEI CORP.	-1.25

NEWS OF A POWERSOFT/SYBASE MERGER SAW THE STOCKS PART WAYS — POWERSOFT SHARES HIT A NEW HIGH WHILE SYBASE DROPPED. PINNACLE MICRO, INC. ISSUES DIVED EARLY LAST WEEK DUE TO REPORTED ACCOUNTING IRREGULARITIES.

Industry Almanac

Not a needle in the haystack

Stac Electronics, Inc. (STAC) is no longer a small player in the data compression market. In the past year, the Carlsbad, Calif., firm has won a patent infringement lawsuit against Microsoft Corp., signed bundling deals with IBM and Novell, Inc. and made nice with Microsoft so that the software giant purchased an equity in Stac and agreed to a technology swap deal. Most recently, Stac has purchased remote access software vendor Ocean Isle, Inc. [CW, Nov. 14].

According to Jonathan Cohen, an analyst at Smith Barney Shearson, Inc. in New York, all of this has placed Stac's Stacker software at the head of the data compression class and offers investors expanding, though speculative, opportunities.

So while the company is playing with the big boys, it is still a small technology issue that may give some investors pause. The purchase of Ocean Isle offers an attractive upside to the stock, however, according to Cohen. "The acquisition is absolutely going to be an additive to earnings and fits in with the company's product line," he said.

Although larger disk drive capacities in new systems may put a dent in the demand for Stacker to some degree, portable users continue to require data compression technology. Cohen pointed out that Stac's technology is platform- and operating system-independent, leaving numerous avenues for growth.

Another positive is the company's move into multimedia with its Multimedia Stacker software, which is targeted at multimedia computers and is optimized for speed, according to a report by Cohen. The product takes advantage of the need to compress huge multimedia files and the growth of the multimedia market.

—Tim Ouellette

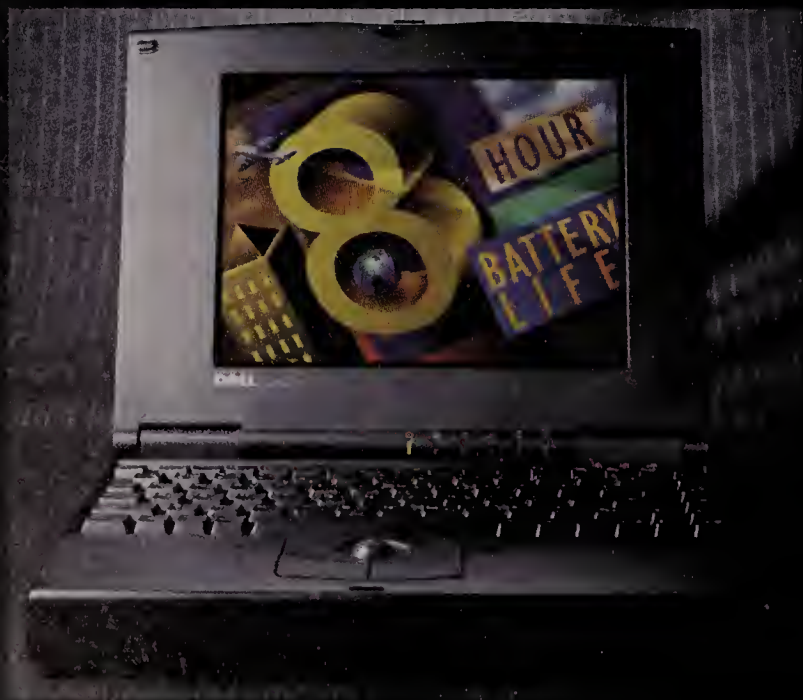
Lots to be thankful for

Stac Electronics has made moves during the past year to ensure that profits stack up in the near future				
	REVENUE	\$31M	\$56M	\$80M
	EARNINGS PER SHARE	\$0	\$0.41	\$0.59
		FY '94	FY '95*	FY '96*
				*Projected

Source: Smith Barney Shearson, Inc., New York

EXCH		52-WEEK RANGE		Nov. 18Wk Net		Wk Pct		3 PM		CHANGE		EXCH		52-WEEK RANGE		Nov. 18Wk Net		Wk Pct		3 PM		CHANGE					
Communications and Network Services										UP 1.84%		Semiconductors										UP 1.66%					
OTC	43.25	16.13	3 COM CORP.	42.75	2.88	7.2	OTC	8.75	2.50	INTERLEAF INC.	4.25	-0.06	1.4	NYS	31.75	16.75	ADVANCED MICRO DEVICES	25.00	0.63	2.6	OTC	20.13	12.25	LATTICE SEMICONDUCTOR	17.13	0.69	4.2
NYS	43.38	36.25	AMERITECH CORP.	40.38	1.38	3.5	OTC	18.00	8.63	INTERSOLV INC.	17.13	1.00	6.7	NYS	36.75	21.13	ANALOG DEVICES INC.	35.75	1.75	5.1	NYS	44.88	15.59	MICRON TECHNOLOGY	40.00	0.75	1.9
NYS	57.13	49.50	AT&T	52.50	-1.63	-3.0	OTC	73.25	27.00	INTUIT INC.	68.56	1.94	2.9	OTC	37.38	11.81	AT&TEL CORP.	34.00	-0.56	-1.6	NYS	60.50	42.13	MOTOROLA INC.	59.75	2.00	3.3
OTC	26.50	12.75	8ANYAN SYSTEMS INC.	18.31	0.44	2.4	OTC	18.75	2.25	KNOWLEDGEWARE INC.	3.75	-0.25	-6.7	OTC	7.50	3.63	CHIPS AND TECHNOLOGIES	6.50	0.25	4.0	NYS	25.00	14.38	NATIONAL SEMICONDUCTOR	18.25	0.75	4.3
OTC	43.88	18.63	8AY NETWORKS INC.	25.63	-1.13	-4.2	OTC	34.75	19.00	LEGENT CORP.	32.13	1.63	5.3	OTC	44.63	24.88	CIRRUS LOGIC	27.00	-0.50	-1.8	OTC	16.25	6.75	SIERRA SEMICONDUCTOR	15.00	0.75	5.3
NYS	62.00	49.00	8ELL ATLANTIC CORP.	51.13	0.88	1.7	OTC	86.50	29.75	LOTUS DEVELOPMENT	41.88	3.63	9.4	NYS	23.50	11.88	CYPRESS SEMICONDUCTOR CORP.(H)	22.75	0.50	2.2	OTC	89.50	58.75	TEXAS INSTRUMENTS	78.63	1.50	1.9
NYS	63.50	50.50	8ELLSOUTH CORP.	52.00	1.13	2.2	OTC	17.75	4.88	MAGIC SOFTWARE ENTERPRISES (L)	4.88	0.38	7.1	OTC	20.13	13.00	DALLAS SEMICONDUCTOR	15.00	1.00	7.1	OTC	16.38	9.38	VLSI TECHNOLOGY	12.38	-0.13	-1.0
NYS	21.50	10.00	8OLT, BERANEK & NEWMAN	18.38	-0.13	-0.7	OTC	15.50	6.00	MANUGISTICS GROUP INC.	7.75	-1.17	18.1	OTC	29.25	14.75	INTEGRATED SILICON SYSTEMS	26.75	0.75	2.9	OTC	10.00	2.88	WEITEK	3.38	-0.50	-12.9
OTC	15.75	9.00	8ROOKTROUT TECHNOLOGY	12.63	1.13	9.8	OTC	27.50	14.75	MAPINFO CORP.	22.25	0.38	1.7	OTC	73.50	56.00	INTEL CORP.	62.69	1.94	3.2	ASE	20.38	8.63	WESTERN DIGITAL CORP.	17.63	0.75	4.4
NYS	53.00	33.06	8ABLETRON SYSTEMS	50.13	0.63	1.3	OTC	7.50	1.44	MATHSOFT	3.25	0.25	8.3	OTC	29.25	14.75	INTEGRATED SILICON SYSTEMS	26.75	0.75	2.9	OTC	60.50	29.00	XILINX (H)	59.00	2.00	3.5
OTC	43.00	10.00	8ENTIGRAM COMMUNICATIONS	20.25	-1.00	-4.7	OTC	17.00	5.88	McAfee ASSOCIATES	14.00	-0.25	-1.8	OTC	45.38	13.25	LSI LOGIC CORP. (H)	43.50	-0.50	-1.1	OTC	37.75	26.50	ZILOG INC.	26.50	-0.75	-2.8
OTC	45.00	21.00	8HIPCOM CORP. (H)	42.50	-0.33	-0.8	OTC	17.25	9.38	MENTOR GRAPHICS	13.38	0.63	4.9	OTC	20.13	12.25	LATTICE SEMICONDUCTOR	17.13	0.69	4.2							
OTC	40.75	18.75	8ISCO SYSTEMS INC.	33.63	0.88	2.7	OTC	20.25	11.50	MICRO FOCUS	14.13	0.38	2.7	NYS	44.88	15.59	MICRON TECHNOLOGY	40.00	0.75	1.9							
OTC	16.13	7.88	8OMPRESSION LABS INC.	8.00	-1.00	-11.1	OTC	11.63	4.63	MICROGRAFX INC.	5.75	0.13	2.2	NYS	60.50	42.13	MOTOROLA INC.	59.75	2.00	3.3							
OTC	12.38	5.13	8OMPUTER NETWORK TECH.	6.88	0.38	5.8	OTC	65.13	38.25	MICROSOFT CORP. (H)	64.50	2.50	4.0	NYS	25.00	14.38	NATIONAL SEMICONDUCTOR	18.25	0.75	4.3							
OTC	32.00	7.50	8ROSSCOMM	10.00	0.00	0.0	OTC	46.50	26.25	ORACLE CORP.	43.50	0.38	0.9	OTC	16.25	6.75	SIERRA SEMICONDUCTOR	15.00	0.75	5.3							
OTC	3.00	1.50	8DATA SWITCH CORP.	2.25	-0.19	-7.7	OTC	40.75	21.50	PARAMETRIC TECHNOLOGY	34.75	-1.00	-2.8	NYS	89.50	58.75	TEXAS INSTRUMENTS	78.63	1.50	1.9							
OTC	35.00	17.88	8DSC COMMUNICATIONS	32.88	0.88	2.7	OTC	24.50	13.38	PARCPLACE SYSTEMS INC.	19.25	1.25	6.9	OTC	16.38	9.38	VLSI TECHNOLOGY	12.38	-0.13	-1.0							
OTC	58.00	20.00	8FORE SYSTEMS INC. (H)	58.00	7.50	14.9	OTC	66.75	26.00	PEOPLESFT	63.75	4.00	6.7	OTC	13.25	6.25	WALKER INTERACTIVE SYSTEMS	6.88	-0.25	-3.5							
NYS	34.88	8.25	8GENERAL DATACOMM INDS.	30.13	-1.88	-5.9	OTC	8.13	3.63	PHOENIX TECHNOLOGIES	6.75	-0.63	-8.5	OTC	30.00	11.75	VIEWLOGIC SYSTEMS	21.63	-0.38	-1.7							
NYS	37.88	29.50	8GTE CORP.	30.13	-0.63	-2.0	OTC	73.25	32.00	POWERSOFT (H)	67.75	6.38	10.4	OTC	23.25	12.25	V MARK SOFTWARE INC.	13.75	-1.88	-12.0							
NYS	95.97	78.63	8ITT CORP.	84.88	-0.50	-0.6	OTC	29.75	3.50	PLATINUM SOFTWARE	14.13	2.00	16.5	OTC	13.25	6.25	WALKER INTERACTIVE SYSTEMS	6.88	-0.25	-3.5							
OTC	29.00	21.38	8MCI COMMUNICATIONS CORP.	21.63	-0.38	-1.7	OTC	23.75	8.75	PLATINUM TECHNOLOGY	20.25	0.00	0.0	OTC	60.00	29.25	WALL DATA INC.	35.38	2.88	8.8							
OTC	15.75	8.13	8MCOM COMMUNICATIONS CORP.	14.00	-0.25	-1.8	OTC	56.75	27.00	PROGRESS SOFTWARE CORP.	32.00	0.50	1.6														
OTC	10.13	3.63	8MICROCOM INC. (H)	10.13	1.25	14.1	OTC	4.13	1.94	QUARTERDECK OFFICE SYS.	2.13	-0.31	-12.8														
OTC	31.00	11.25	8NETMANAGE INC.	28.50	0.00	0.0	OTC	24.00	9.50	RAINBOW TECHNOLOGIES INC.	15.38	-0.63	-3.9														
OTC	7.38	4.00	8NETRIX CORP. (H)	7.13	0.38	5.6	OTC	9.25	2.63	RASTEROPS (L)	2.63	0.00	0.0														
OTC	8.75	3.25	8NETWORK COMPUTING DEVICES	4.50	0.38	9.1	OTC	8.50	2.88	ROSS SYSTEMS	5.94	1.44	31.9														
NYS	22.25	7.38	8NETWORK EQUIPMENT TECH.	20.88	1.38	7.1	OTC	23.25	2.38	SAPIENS INTL. CORP. N.V.	2.56	-0.31	-10.9														
OTC	23.38	12.50	8NETWORK GENERAL	21.75	1.13	5.5	OTC	21.00	9.75	SOFTKEY INTERNATIONAL INC. (H)	18.88	-0.88	-4.4														
OTC	9.63	6.38	8NETWORK SYSTEMS CORP.	7.25	0.38	5.5	OTC	8.63	3.00	SOFTWARE PUBLISHING CORP.	5.63	0.63	12.5														
NYS	68.75	26.50	8NEWBRIDGE NETWORKS CORP.	34.50	2.25	7.0	OTC	10.00	5.00	STATE OF THE ART	8.25	-0.25	-2.9														
NYS	37.75	26.00	8NORTHERN TELECOM LTD.	33.75	0.00	0.0	NYS	35.63	25.00	STERLING SOFTWARE INC.	30.50	-0.63	-2.0														
OTC	26.63	13.38	8NOVELL INC.	19.75	1.50	8.2	OTC	19.88	3.63	STRUCT. DYNAMICS RESEARCH	6.25	0.25	4.2														
NYS	43.75	33.25	8NYNEX CORP.	38.75	0.75	2.0	OTC	57.00	33.25	SYBASE INC.	44.25	-3.75	-7.8														
OTC	30.00	15.50	8OCTEL COMMUNICATIONS CORP.	21.00	-0.50	-2.3	OTC	18.75	9.88	SYMANTEC CORP.	18.75	1.75	10.3														
OTC	24.75	10.75	8OPTICAL DATA SYSTEMS INC. (H)	24.25	2.75	12.8	OTC	49.75	33.00	SYNOPSYS	45.25	0.00	0.0														
OTC	7.50	2.69	8PENRIL DATA COMM NETWORKS	2.69	-0.19	-6.5	OTC	18.00	10.63	SYSTEM SOFTWARE ASSOC.	13.63	-0.13	-0.9														
OTC	22.50	10.00	8PICTURETEL CORP. (H)	20.75	-1.00	-4.6	OTC	6.75	3.25	TRINZIC CORP.	5.19	0.06	1.2														
OTC	7.88	2.13	8PROTEON INC.	5.88	-0.50	-7.8	OTC	30.00	11.75	VIEWLOGIC SYSTEMS	21.63	-0.38	-1.7														
OTC	14.38	2.75	8RACOTEK INC.	3.94	-0.06	-1.6	OTC	23.25	12.25	V MARK SOFTWARE INC.	13.75	-1.88	-12.0														
OTC	11.25	4.25	8RETIX	5.13	-0.13	-2.4	OTC	13.25	6.25	WALKER INTERACTIVE SYSTEMS	6.88	-0.25	-3.5														
NYS	23.25	12.44	8SCIENTIFIC ATLANTA INC.	22.00	1.38	6.7																					
NYS	45.25	36.75	8SOUTHWESTERN BELL CORP.	42.00	1.75	4.3																					
NYS	40.13	30.75	8SPRINT CORP. (L)	30.75	-1.13	-3.5																					
OTC	26.75	13.38	8STANDARD MICROSYSTEMS CORP.	23.38	1.00	4.5																					
OTC	61.00	13.00	8STRATACOM INC.	57.75	4.00	7.4																					
OTC	15.25	3.88	8TELEBIT CORP.	4.88	0.25	5.4																					
OTC	46.00	23.00	8US ROBOTICS	40.13	1.00	2.6																					
NYS	47.25	35.63	8U S WEST INC.	35.88	-0.63	-1.7																					
OTC	28.25	12.75	8XIRCOM	17.13	0.38	2.2																					
OTC	36.75	13.25	8XYLOGICS INC. (H)	36.75	2.25	6.5																					
OTC	28.13	11.25	8XYPLEX INC.	27.75	0.00	0.0																					
PCs and Workstations										UP 3.92%		Peripherals and Subsystems										UP 1.53%					
OTC	7.50	3.00	ADVANCED LOGIC RESEARCH	4.75	0.38	8.6	OTC	30.50	14.50	AMERICAN POWER CONVERSION	17.13	0.00	0.0	OTC	30.50	14.50	AMERICAN POWER CONVERSION	17.13	0.00	0.0	OTC	27.25	18.25	BANCTEC INC.	20.75	-0.63	-2.9
OTC	43.75	24.63	APPLE COMPUTER INC.	39.88	-1.25	-3.0	OTC	27.25	18.25	BANCTEC INC.	20.75	-0.63	-2.9	OTC	6.25	3.25	CAMBEX CORP.	4.00	0.38	10.3	OTC	6.25	3.25	CAMBEX CORP.	4.00	0.38	10.3
OTC	33.00	10.38	AST RESEARCH INC.	12.94	0.44	3.5	ASE	5.50	1.88	COGNITRONICS CORP.	1.94	-0.13	-6.1	ASE	5.50	1.88	COGNITRONICS CORP.	1.94	-0.13	-6.1	OTC	15.25	6.75	SIERRA SEMICONDUCTOR	15.00	0.75	5.3
NYS	42.00	21.88	COMPAQ COMPUTER CORP.	39.75	0.75	1.9	NYS	20.50	10.25	CONNER PERIPHERALS	12.75																

LITHIUM ADDS HOURS TO YOUR LIFE.



For those of you on a desperate quest for longevity, take a hit of this. The amazing Lithium Ion battery in the Dell® Latitude™ XP notebook.

This Lithium Ion technology adds hours of juice to your battery life. Up to an unprecedented total of eight hours of power^Δ

So, if you are the type with a workhorse mentality, this Lithium Ion battery is one heck of a power station. It intelligently works with our unique power management

DELL LATITUDE XP
IntelDX2™ 50MHz System

- 9.5" Dual Scan STN Color
- 8MB RAM (36MB Max RAM)
- 340MB Hard Drive
- New Smart Lithium Ion Battery
- Optional Desktop Expansion Device with built-in Ethernet and SCSI
- 32-bit Accelerated Local Bus Video with 1MB Video RAM
- PCMCIA Slots: 2 Type II or 1 Type III
- 6 Lbs. (8.75" x 11.0" x 2.0")
- 3-year Limited Warranty*
- 30-day Money-back Guarantee*

\$3199

Business Lease^Δ: \$118/MO.

Order Code #300182

(^ΔActual battery life will vary depending on nature and frequency of use and configuration.)

software to dynamically adjust the notebook's energy consumption.

It's all the result of Dell's efficient engineering, which allows the Latitude XP notebook to provide the necessary high performance without sacrificing valuable battery power.



In fact, the Latitude XP is so impressive, *PC Computing* called it "the fastest, longest-lasting 486 notebook our lab has ever seen" (10/94 issue, p.57).

So, to experience how a little lithium can do wonders for your vitality, call us today to order Dell Latitude XP notebooks. We assure you, it'll have an effect on you that will last for hours.

DELL™

(800)626-4398 KEYCODE #11HS2 MONDAY-FRIDAY 7AM-9PM CT • SATURDAY 10AM-6PM CT • SUNDAY 12PM-5PM CT • CANADA* CALL 800-387-5755 • MEXICO CITY* CALL 800-228-7811

*Guarantees available in the U.S. only for registered owners of Dell Latitude Series systems purchased after 8/8/94. For a complete copy of our Guarantees or Limited Warranties, please call our TechFax™ line at 1-800-950-1329, or write Dell Computer Corporation, 2240 W. Braker Lane, Building 3, Austin, TX 78758. *Prices valid in the U.S. only. Some products and promotions may not be available outside the U.S. Prices and specifications subject to change without notice. ^ΔBusiness leasing arranged by Leasing Group, Inc. The Intel Inside logo is a registered trademark and IntelDX2 is a trademark of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.

Cairo falters again

CONTINUED FROM COVER 1

cept. They cited reduced training costs as a major benefit of getting the new Windows interface on NT sooner.

The advantages of having the same interface on both NT and Windows 95 would be lower training costs and greater usability, according to Warren Smith, a certified public accountant at Pacific Bell in San Ramon, Calif. "I think Microsoft would be doing themselves and their users a big service," he said.

"I think Windows 95 is going to move out in the market pretty fast, certainly in larger organizations, [and having the same interface] would make it easier to maintain Windows-based systems," said Dennis Moran, president of Graphical Bytes, Inc. in Southampton, N.Y.

Many corporate and governmental information systems managers, pending testing and approval, are looking forward to deploying Windows 95 six to 12 months after its ship date, which is currently set for the first half of next year [CW, Nov. 14].

At the same time, many of those same managers are already deploying Windows NT as a workstation operating system for so-called power users and others who need to work in a highly secure environment or run workstation applications.

The problem for those IS managers, once Windows 95 ships, will be training and supporting users on two very different user interfaces. This could be particularly sticky with users who may run Windows 95 on a daily basis but switch to an NT-based workstation periodically to perform other job duties.

"Since training is my most important [task], if I have NT on my [geographical information system] stations and all the other machines on Windows 95, it's a problem," said Connie Dillard, a microcomputer specialist for the San Carlos School District in California.

"Once users get used to the Windows 95 in-

terface, it would be difficult for your classic nonpower user to jump between the two interfaces anymore [because] it would be confusing," Moran said.

But Maples disputed the benefit of having the new user interface on NT because about 70 million machines run the Windows 3.1 interface, the same interface NT 3.5 has.

Those users are not going to upgrade overnight, and even though Microsoft would like them to, many of them work on older machines that are not capable of running Windows 95, he noted.



Microsoft CEO Bill Gates makes no commitment on an interim NT 3.5

"The determining factor for corporations is not with the user interface but with the existing hardware base," Maples said. Until the older, less-capable hardware is phased out, corporations will be stuck with running, and thus supporting, PCs with the old interface.

Additionally, while many analysts predict that virtually all new PCs will ship with Windows 95 by the time the system has been out for a year, many OEMs initially will ship machines with either Win-

dows 3.1 or Windows 95 and possibly both (see notebook page 16).

A server platform

Further, many corporations that have decided to invest in NT are deploying it only as a server, which makes the user interface a much less important issue. "I doubt that we'll see [NT on the desktop] here any time soon, so I would say it is not necessarily a fallback for Windows 95 because it's so different in terms of its resource consumption," said one IS executive at a large, East Coast, multinational manufacturer.

Still, one influential user who has been briefed by Microsoft said the company does have plans to release an interim version of NT with the Windows 95 interface.

But another user said that sword could possibly cut both ways. "If you can have all of the good things that you get with NT, and that would have the best interface to harness that power, you probably want [NT instead] of Windows 95," said Daniel Willis, lead analyst at 3M Co.'s Information Technology group in Minneapolis.

Onetime modem king goes Chapter 11

Price war ends Hayes reign

By Suruchi Mohan and Michael Fitzgerald

■ **Modem maker, onetime technology standard setter and market trailblazer Hayes Microcomputer Products, Inc. last week filed for bankruptcy.**

Even to its employees, the news came as a surprise, although analysts said they knew the Atlanta-based company was in trouble. "I didn't think it was this bad. [I thought] they would get out of it," said Cheryl Currid, president of Currid & Co. in Houston. She said she had expected a merger or acquisition, not Chapter 11 bankruptcy.

But Hayes' situation is indicative of the competition in the modem marketplace, which makes for smaller profit margins and calls for more aggressive leadership in technology.

"They got caught in the price war," said Ken

Camarro, president of Camarro Research in Fairfield, Conn. "They were involved in value add, which shifted to the semiconductor industry," he said.

Technology issues cited

It was not just that modems became a commodity; Hayes was not able to maintain its leadership role technologically. "They had difficulty in sustaining their reputation for a premium product," said James Rafferty, president of Human Communications in Danbury, Conn. The firm found it hard to differentiate themselves from others modem makers.

They did not really play in the PCMCIA market or get their V.34 product out in the right time frame, said Gerry Purdy, editor of "MobileLetter" in Cupertino, Calif.

Just last August, Hayes had reorganized itself into four business units: PC modems, LAN connect, WAN access and system products. This led to a reduction of 40 jobs.

Switched

CONTINUED FROM COVER 1

"ACMS allows network administrators to tap into any call between users strung between several switches, to any workstation," said Roger Dev, director of software development at Cabletron. This will incorporate the functions of Network General Corp. Sniffer-type devices and Remote Network Monitoring (Rmon) probes into a centralized management platform, he said.

This is vital because a true switched virtual network, with no permanent connections between individual nodes or LAN segments, will have no logical place to put a management probe. Calls between end points are set up and torn down on a continual basis and are controlled by software.

No management platform offers these capabilities today. Many vendors offer switches that allow data to be sent from legacy LANs to ATM LANs. Most also offer proprietary software packages to manage either side but not both.

"Today you're blind on one side or the other," Dev said. "ACMS will provide end-to-end connection management from [legacy] LANs to ATM."

Ready for prime time?

According to some users, the absence of comprehensive management for switched ATM networks is a main factor holding ATM back from prime time. "There are a lot of proprietary [management] products out there, and when you try and mesh them all together you have a big problem," said David Beering, a telecommunications analyst at Amoco Corp. in Chicago.

Currently, users can monitor switched LANs by putting devices such as a Sniffer or an Rmon probe on each critical LAN segment.

But observers expect switching to lead to networks composed of hundreds of segments, which would make these options impractical to say the least. That is because users would either have to continually lug Sniffer-like devices around or put an Rmon probe on every segment, which would be very costly and time-intensive.

"There really aren't any tools out there to help manage [switched LANs], which is something that has been dogging this marketplace," said Fred McClimans, principal analyst at Decisis, Inc. in Ashburn, Va.

"In the emerging ATM world, there won't be many probe points [from which to] gather diagnostic information on all your network traffic. ACMS looks like it might provide an answer," said a network manager at a large power

company in the Northeast, who requested anonymity.

In addition to call-tracing and tap-monitoring features, ACMS will provide the following higher-level management functions:

- Automatic setup and tear-down of switch connection tables.
- Route selection or multiple classes of service. Users can set parameters to have ACMS set up the shortest, cheapest connection or the quickest connection for time-sensitive data, for example.
- Traffic management: bandwidth allocation and statistical multiplexing.
- Call accounting for bill-back purposes.

Switching promises

The typical bridge/routed network is connectionless, meaning data packets are delivered much like the mail — generally distributed and then sorted by address codes that resemble ZIP codes. This method can require much handling along the way, and errors or lost packets are common. LAN/ATM switched networks are like a telephone switchboard in that they are connection-oriented. Individual nodes on a network get dedicated connections to nodes they wish to communicate with. Because of this, switched networks hold the promise of providing a more efficient, cost-effective and controllable method of data communication.

ACMS will also provide policy management services that allow administrators to implement access control in virtual networks. For example, when a new manager is hired and added to the network, he will automatically be given the access privileges that correspond to the position.

A way to manage

Texas Instruments plans to be heavily involved in ATM next year for backbone and wide-area applications. But Blair said TI will also begin running ATM to certain desktops using switches and will need a way to manage them. "Every vendor has its own point product now, but a comprehensive method of management is lacking," Blair said.

ACMS will be available as an add-in board for Cabletron's Multimedia Access Center hubs and has a stand-alone PC-based platform. Cabletron's Spectrum management platform is not required to use ACMS.

ACMS will be managed as an application under Spectrum. It will support Hewlett-Packard Co.'s OpenView, IBM's NetView and Sun Microsystems, Inc.'s SunNet Manager. Pricing was not available.

Senior editor Steve Moore contributed to this article.

More fascinating fax

"Alexander Bain, a Scottish clockmaker, patented fax technology in 1842, two years before Samuel Morse patented the telegraph. ... It was only the 1982 decision of several Japanese firms to adopt the CCITT Group III digital fax standard that enabled the technology to explode in the business community."



Source: Robert Bliss, Curmudgeon's Corner, "CrossTalk," U.S. Air Force

WYSIWYG



A hacker's Thanksgiving

Are you a fanatic computer hacker who just doesn't have time to go through the niceties of preparing a turkey dinner and sitting down at the table to eat it? Here's a recipe for the hacker gourmet known for his taste in fine holiday foods:

Five-minute pizza

Ingredients: one phone

Dial local pizza delivery, pay delivery person and eat

Source: *GigaBytes: The Hacker Cookbook*, by Jenz Johnson

Don't press THAT key!



Most workers know the frustration of hitting the wrong key and dealing with the resulting confusion with the computer. DataCal Corp. in Chandler, Ariz., hopes to solve this problem by offering custom-made key-caps, keytop overlays and keyboard templates. Workers beware: Now there shouldn't be any excuse for not knowing what key to press!

WYSIWYG COMPILED BY TIM OUELLETTE. ILLUSTRATIONS BY DAVID MARSHALL.

How to contact *Computerworld* editors:

	PHONE:	FAX:
Main office, Framingham, Mass. _____	(508) 879-0700	(508) 875-8931
24-hour tip line _____	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J. _____	(201) 587-0090	(201) 712-1808
Washington bureau, Washington _____	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill. _____	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif. _____	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash. _____	(206) 641-7770	(206) 747-1021

✉ **ELECTRONIC MAIL:** *Computerworld's* writers and editors have individual MCI Mail accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

✉ Our CompuServe account number is 76537,2413. Please use that account only for communications with writers and editors. *Computerworld* cannot guarantee response to all inquiries. Direct subscription inquiries to CompuServe: 73373,1230.

✉ **Letters to the editor** and other editorial-related messages can be sent via Internet to letters@cw.com

✉ **CLIENT/SERVER JOURNAL:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at aalper@cw.com

✉ **SUBSCRIPTIONS:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

✉ **REPRINTS:** Contact Sharon Bryant at (508) 820-8125.

✉ **RAPID REFERENCE CLIPPING SERVICE:** (800) 343-6474 x554.

Inside Lines

Catching 4-pound butterflies

IBM's Butterfly subnotebook was spotted wafting around a back room at Comdex. The sub-4-pound box features a 10.4-in. active-matrix color screen and a keyboard that slides out to give the subnotebook-size machine a full-size keyboard. It will come with a 340M- or 540M-byte hard drive, a 25/50-MHz Intel i486DX2 processor and built-in telephony features. It will probably cost about \$5,000, sources said. Look for it in late January. IBM officials declined to comment on the unannounced product.

Bad company: Green cards and the GOP

When asked last week about the GOP resurgence in Congress and its potential impact on the high-tech agenda, Philippe Kahn, chairman of Borland International, said, "I'll speak from my heart. The worst part for the industry is what just happened with [California's] Proposition 187. It discourages the immigration of high-tech talent. I was illegal for four years, and I created some stuff. That is my main concern. The rest is fairly irrelevant."

The techno-sexy side of Comdex

Even as the vendors inside the cavernous Las Vegas Convention Center plied the teeming masses at Comdex with tons of glossy technical brochures and publicity materials last week, enterprising purveyors of a different kind of service were working the crowds outside. As visitors staggered from the convention center, several grabbed the material being handed out along the sidewalks. But instead of finding more literature extolling the virtues of new technologies, what they got were some very graphic and descriptive listings—complete with grainy pictures—of services at some of the seedier fleshpots in this oh-so-classy city.

Three bricks shy of a load

A client/server-oriented rewrite of IBM's AS/400 will hit the streets the day after Thanksgiving, but AS/400 shops might not be thankful for the absence of several key pieces that have been delayed until February. Among the missing is support for a new file-serving processor that is supposed to ease the AS/400's reputation as a LAN server laggard. Users will also have to bide their time before getting a new version of PC connectivity software and a file system that will allow Unix and Windows developers to write AS/400 applications in their native programming modes. IBM tried to put a happy face on it all by noting that 90% of the promised code will ship on schedule, including new database and TCP/IP releases.

Too many people overboard

Re-engineering has taken a bad rap because of poorly implemented projects, according to renowned re-engineering guru Michael Hammer. "It is true that re-engineering sometimes doesn't work, but it is not a high-risk endeavor," he said, speaking somewhat defensively at a Sun satellite broadcast last week. He said many people confuse re-engineering with downsizing, which is when "you throw people out of the boat, and the survivors of the purge have to work twice as hard to pick up the slack of the people who are gone—plus they're demoralized."

The dangers of videoconferencing were embarrassingly—and pointedly—demonstrated in front of a vast Comdex audience last week in Las Vegas. An Intel executive, speaking from his Oregon office, gave a pitch about the power of ISDN-based conferencing. After he finished, Intel CEO Andrew Grove got up to wrap up the session. As the room erupted in laughter, Grove looked up to see his colleague apparently picking his nose on-screen. Bob Metcalfe, a columnist for InfoWorld newspaper, finally tiptoed over to the demonstration machine to minimize the videoconference window. Asked about it later, Metcalfe insisted the hapless executive had only been twirling his mustache. To pass along other such embarrassing stories or just plain old news items and tips, call Computerworld's 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.

The New Watcom SQL 4.0. You Would Think We Looked at Your Wish List.

Introducing the database server you've been waiting for: **Watcom SQL 4.0.**

With powerful features like stored procedures, triggers and cascading updates and deletes, Watcom SQL 4.0 can enforce your business rules and ensure data integrity.

In addition, dynamic multiple database support gives you and your users the unique ability to add and remove databases on the fly.

And, take a look at our self-tuning query optimizer; it learns as you use it. Each query performed against your database teaches the optimizer about your data, making it smarter... and faster. This dramatically reduces the costs associated with set-up and performance optimization of your DBMS by expert personnel. Also, the Watcom SQL product line includes both standalone and network servers built to allow you to move seamlessly between single and multi-user environments.

SQL DATABASE REQUIREMENTS

✓ STORED PROCEDURES

✓ TRIGGERS

✓ CASCADING UPDATES & DELETES

✓ DYNAMIC MULTIPLE DATABASE SUPPORT

✓ HIGH PERFORMANCE-ADVANCED OPTIMIZER

✓ LOW MAINTENANCE-SELF-TUNING

✓ STANDALONE-WORKGROUP-DEPARTMENTAL

✓ SEAMLESS SCALABILITY

✓ NETWARE, WINDOWS, OS/2, NT

✓ LOW PRICE

6 USER - \$795
UNLIMITED - \$4995

WATCOM SQL V4.0



This is the database server with the functionality, performance and versatility you've been waiting for. Don't let the price fool you!

To check out the new features of Watcom SQL 4.0, call 1-800-395-3525 today.

Watcom
A Powersoft Company

Watcom and the Lightning Device are trademarks of Watcom International Corporation. Other trademarks are the properties of their respective owners. Copyright 1994 Watcom International Corporation.

Here's a novel idea. IT actually making money.

If you've been trying to figure out how to squeeze better returns from your IT investment, you should call Siemens Rolm®.

We can help protect your investment because our phone systems work within your existing LAN, PC, or mainframe environment. We can also help your business run a lot more efficiently. Adding thousands to your bottom line.



Siemens is the world's largest private communication systems manufacturer. We have the technology to help your business work more efficiently worldwide.

The IT department for Collin County, Texas couldn't agree more. With just a handful of staff members, they had to service a county that was growing fast. Rather than subject this influx of callers to busy signals and long hold-times, their IT department

chose to install a Rolm phone system. Now they can easily handle the increase in incoming calls and transmit data through those same lines.

The result: an improved data transmission system that will save them \$50,000 annually, not to mention an additional \$60,000 on their annual phone bill. And they estimate they'll save two million dollars over the next ten years when they take into account the increased volume of calls.

If you'd like to help your company reduce costs, increase revenues or improve customer service, call the phone number below. We'll be glad to send you our free booklet entitled "101 Ways To Make Or Save Money With Your Phone System." And, of course, it's a free call.

See, we're already saving you money.

SIEMENS

ROLM Communications

1-800-ROLM-123 ext. CW13